

Science



Head of Department: Ms Mary Balogun

S O A R
SERVICE OPPORTUNITY ASPIRATION REWARD

YEAR 7-13 CURRICULUM ROADMAP SCIENCE

CRITICAL SCHOLARS

SUBJECT MASTERS

LOVERS OF LEARNING

Year 13 Summer
CRITICAL SCHOLARS
Biology/Chemistry/Physics:
Independent thinkers applying skills & knowledge

Year 13 Spring
MOVING TO CRITICAL SCHOLARSHIP
Biology/Chemistry/Physics:
Mastering the language & developing more complex skills

Year 13 Autumn
DEVELOPING CRITICAL SCHOLARS
Biology/Chemistry/Physics:
Transition & routines; retrieving and applying what they know; building confidence & independence

Year 12 Summer
TALKING THE TALK
Biology/Chemistry/Physics:
Independent thinkers applying skills & knowledge

Year 12 Spring
TALKING THE TALK
Biology/Chemistry/Physics: Mastering the language & developing more complex skills

Year 12 Autumn
STEPPING STONES
Biology/Chemistry/Physics:
Transition & routines; retrieving and applying what they know; building confidence & independence

Year 11 Summer
SUBJECT MASTERS
Revision: Review and consolidate knowledge and skills learned in preparation for exams to ensure understanding and confidence in science.

Year 11 Spring
MOVING TO MASTERY
Waves and rate: Discover how waves transfer energy and information through mediums, and how rates measure changes over time in various physical and chemical processes...

Year 11 Autumn
DEVELOPING SUBJECT MASTERS
Inheritance and forces: Learn how traits are passed down from parents to offspring through genes, and how forces like gravity and electromagnetism affect objects' motion and interactions in the physical world.

Year 8 Summer
SUBJECT IN ACTION
Waves and forces: Explore what happens when objects interact, and learn about the behaviour of waves, such as sound and light, and how they transfer energy.

Year 8 Spring
BUILDING ON OUR STORY
Chemistry in action: Explore how chemistry affects everyday life, from the reactions that cook our food and clean our homes to the processes that produce energy and medicines.

Year 8 Autumn
FANNING THE FLAMES
My body and what happens when it goes wrong? Explore how body systems work together to maintain health and what happens when they malfunction, leading to diseases and disorders.
Where did I come from? Explore the fascinating journey of human reproduction and how traits are passed down through generations.

Year 9 Autumn
FIRESTARTERS
Key concepts in science: Use key ideas to explain observations and make predictions
Maths for Science: Opportunity to explore and apply mathematical methods and principles to solve problems, analyse data.

Year 9 Spring
WHERE OUR STORY TAKES US
Foundations in Biology: Explore the basic concepts and principles about how living things work, grow, and interact with their environment.

Year 7 Summer
SUBJECT IN ACTION
Energy for everything: uncover the essential role energy plays in all aspects of life, from powering our homes and gadgets to driving natural processes like photosynthesis and weather patterns.

Year 7 Spring
THE STORY OF WHERE IT BEGAN
What is everything made of?: A dive into the fascinating world of atoms, the fundamental building blocks of all matter, as well as elements and the periodic table

Year 7 Autumn
LIGHTING FIRES
My body and how it works: Explore the anatomy and functions of vital organs, learn how different body systems work together, and discover the science behind growth, health, and disease.

SERVICE OPPORTUNITY ASPIRATION REWARD

Curriculum Intent

We **serve** our students with an adaptive curriculum that meets the needs of all. Our different subjects have carefully identified plans outlining, what they teach and why. This is shared with all students, staff and parents to empower our community in their learning journey and includes careful consideration of sequencing of knowledge and skills. Cardinal Pole is committed to providing **opportunities** for staff and students to become life-long lovers of learning through personalised feedback, opportunities for reflection and progression. We are a community of **aspirant** learners where teachers are experts and students are critical scholars. This is achieved through absolute clarity of expectations and constant re-evaluation of needs through a shared language. We **reward** our community of learners by celebrating the successes, progress and achievements of all.

How do all SCIENCE lessons start? (Ready to Learn)

All lessons at Cardinal Pole start with a 'Ready to Learn' activity. The purpose of this is to support retrieval and prepares students for the lesson with recalling relevant knowledge. This activity is printed for students and handed out at the door. Students are expected to sit at their desk immediately and complete the task before sticking it in their books while the teacher welcomes the class and takes the register.

Ready to Learn activities in **SCIENCE** look like this:

Plant cells

18/06/2025



- Copy

Chloroplast – absorbs light for photosynthesis.

Definition

- State the function of the nucleus.

Contains genetic material
(DNA) that controls the cell.

Last Lesson

- State the function of the cell membrane.

Controls the movement of
substance in and out of the cell.

Last Term / Last Year

- Suggest some different types of plants.

Tree, grass, daisy, dandelion

Stretch & Challenge

Ready to learn

One Voice

Work hard

Y7 Science

Becoming a physicist

Calculating a speed of a toy car.

How does a satellite stay in orbit?

Big picture: Identify contact, non contact forces and effect of forces

Be able to calculate speed of different objects

Becoming a physicist

Which object would keep your soup warmest and why?

Becoming a chemist

Observing the physical and chemical reactions of increasingly volatile elements

How are elements organised in the periodic table?

Big picture: Identify the key features of the periodic table techniques and describe the physical and chemical features of specific groups of elements

Becoming a chemist

Distillation, chromatography and filtration in action

How do you separate substances?

Big picture: Identify the key features of different separation techniques and describe how they work

My body and me: heart and lungs

Big picture: Identify the key features of the lungs, the heart and the circulatory system and describe how it works

How do cells work together?

Big picture: Levels of organisation: cells → tissues → organs → organ system → organism; identify the key stages and organs in the digestive system and describe how it works

What are the building blocks of life?

Big picture: Building on KS2 knowledge of plants and photosynthesis; identify the key features of animal and plant cells and describe how it works

How does heat transfer work?

Big picture: Identify the key features of conduction, convection & radiation and describe how they work

What are the fuels that give us energy?

Big picture: Identify renewable and non-renewable fuels and describe how they work

How do elements work together?

Big picture: Identify atoms, elements, compounds & polymers; describe how they work together and apart

Becoming a chemist

Using Bunsen burners to explain changes of state

Becoming a physicist

Using EPC ratings to select the printer for CP

Will energy ever run out?

Big picture: Identify the nine stores of energy and how they transfer between stores.

Becoming a physicist

Take on the role of energy consultant to reduce energy costs for Cardinal Pole

Why do particles matter?

Big picture: Identify the key features of states of matter (solid, liquid & gas) and describe their properties

Becoming a biologist

Chicken wing dissection

My body and me: joints, muscles & skeleton

Big picture: Identify the key features of the body responsible for movement and describe how it works

Becoming a biologist

Heart dissection to identify key features of a heart in real life; Effect of exercise on heart rate

Becoming a biologist

The journey of my food: the diary of a fried chicken!

Becoming a biologist

Using a microscope to identify key features of animal and plant cells in real life

Y7 Science – Catch up

Becoming a physicist

Measure the speed of a toy car

How does a satellite stay in orbit

Spell and identify key forces

Becoming a physicist

Use basic scientific equipment to calculate temperature change

How does heat transfer work

Carry out practicals to show how energy is transferred

Will energy ever run out?

Do basic division to calculate percentages

Becoming a chemist

Describe chemical reactions using what you see

What are the fuels that give us energy?

Think about different fuels and how they are used

Will energy ever run out?

Spell the nine energy stores

How are elements organised in the periodic table

Identify and spell different elements from the periodic table

How do elements work together

Label diagrams of atoms, elements and compounds

Becoming a physicist

Identify parts of the school where energy is lost

Why do particles matter?

Draw basic diagrams for solids, liquids and gases.

Becoming a chemist

Separate a mixture using filtration, chromatography and distillation

Becoming a biologist

Dissect a chicken wing

How do you separate substances?

Separate basic mixtures. Label basic equipment

Becoming a chemist

Learn how to use a Bunsen burner

My body and me: joints, muscles & skeleton

Spell parts of the skeletal system and match their basic functions

My body and me: heart and lungs

Spell the parts of the heart and lungs. Match these to their function. Label these on a diagram. Build a model of the lungs

How do cells work together?

Spell the levels of organisation. Identify and spell key parts of the digestive system and match them to their location

Becoming a biologist

Spell key parts of the heart. Label these parts of the heart on a diagram. Basic multiplication for heart rate

Becoming a biologist

Use a fried chicken meal to identify the organs the food passes through

Becoming a biologist

Use a microscope to look at animal and plant cells. Basic division to calculate magnification

What are the building blocks of life?

Spell the organelles of a cell and match them to their function, label the basic parts of animal and plant cells. Build a model of a cell

How is your progress measured in Science in Autumn Term 1?

Autumn 1: Becoming a Biologist

Cells quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
Cells and digestive system topic test	A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Cells I can label the required organelles of an animal and plant cell I can label the key parts of a light microscope I can recall the microscopy equation and calculate simple magnifications I can recall adaptations of specialised cells The digestive system I can state the organs of the digestive system I can describe how food is digested in the small intestine	Cells I can describe the functions of the required organelles of an animal and plant cell I can describe the functions of the key parts of a light microscope I can rearrange the microscopy equation to find image size and real size I can describe adaptations of specialised cells The digestive system I can state the function of the organs of the digestive system I can state simple adaptations of the villi	Cells I can compare between animal and plant cells I can describe a 4-step method of how to view a prep-prepared slide of a cell I can convert between units when using the microscopy equation I can explain adaptations of specialised cells The digestive system I can describe the journey our food takes through the digestive system I can explain adaptations of the villi

How is your progress measured in Science in Autumn Term 1 (Catch up)?

Autumn 1: Becoming a Biologist

Cells quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
Cells and digestive system topic test	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Cells I can spell the organelles of an animal and plant cell I can spell the parts of a light microscope I can do basic division calculations I can state examples of specialised cells The digestive system I can spell the organs of the digestive system I can state the journey of food through the digestive system	Cells I can label the required organelles of an animal and plant cell I can label the key parts of a light microscope I can recall the microscopy equation and calculate simple magnifications I can recall adaptations of specialised cells The digestive system I can label the organs of the digestive system I can describe how food is digested in the small intestine	Cells I can describe the functions of the required organelles of an animal and plant cell I can describe the functions of the key parts of a light microscope I can rearrange the microscopy equation to find image size and real size I can describe adaptations of specialised cells The digestive system I can state the function of the organs of the digestive system I can state simple adaptations of the villi

How is your progress measured in Science in Autumn Term 2?

Autumn 2: Becoming a Biologist

Cardiorespiratory system quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
Cardiorespiratory system and musculoskeletal topic test	A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Whole school assessment point 1

Emerging	Achieving	Excelling
The cardiorespiratory system I can state the key organs involved in breathing I can describe the model of the heart I can state the functions of the arteries, veins and capillaries I can state the effect of exercise on breathing The musculoskeletal system I can state the names of bones in the body I can state where joints are found	The cardiorespiratory system I can describe the functions of the key organs involved in breathing I can describe the journey the blood takes through the heart I can describe how the structures are related to the functions of arteries, veins and capillaries I can describe the effect of exercise on breathing The musculoskeletal system I can describe 2 functions of the skeleton I can describe the functions of different joints	The cardiorespiratory system I can describe the journey oxygen and carbon dioxide take in breathing I can explain why the heart is a double circulatory system I can explain how issues with arteries are related to diseases I can explain the effect of exercise on breathing and heart rate The musculoskeletal system I can describe all the functions of the skeleton I can explain the functions of antagonistic pairs

How is your progress measured in Science in Autumn Term 2 (catch up)?

Autumn 2: Becoming a Biologist

Cardiorespiratory system quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
Cardiorespiratory system and musculoskeletal topic test	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question
Whole school assessment point 1	

Beginning	Emerging	Achieving
The cardiorespiratory system I can spell the key organs involved in breathing I can label the model of the heart I can identify arteries, veins and capillaries I can carry out exercise and describe the effect on breathing The musculoskeletal system I can spell the names of bones in the body I can spell the key parts of joints	The cardiorespiratory system I can state the key organs involved in breathing I can describe the model of the heart I can state the functions of the arteries, veins and capillaries I can state the effect of exercise on breathing The musculoskeletal system I can state the names of bones in the body I can state where joints are found	The cardiorespiratory system I can describe the functions of the key organs involved in breathing I can describe the journey the blood takes through the heart I can describe how the structures are related to the functions of arteries, veins and capillaries I can describe the effect of exercise on breathing The musculoskeletal system I can describe 2 functions of the skeleton I can describe the functions of different joints

Y7 Biology: Cells

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1. What are cells?	Emerging (catching up): State what a cell is.	1) State the definition of an organelle. 2) Describe the function of the mitochondria. 3) Describe the function of the nucleus. 4) Suggest one example of a cell in the human body and their function (what they do).
	Achieving (keeping up): Describe the different organelles in an animal cell and their function.	
	Excelling (going beyond): Suggest what cells in the human body will have more of a certain type of organelle	
2- What are Plant cells?	Emerging (catching up): Identify and label components of a plant cell.	1) State the function of the cell wall. 2) State the function of the vacuole. 3) State the function of the chloroplast. 4) State the name of the green pigment in leaves. 5) State one thing that is needed for photosynthesis to take place.
	Achieving (keeping up): Describe the functions of plant cells organelles.	
	Excelling (going beyond): Describe similarities and differences between plant and animal cells	
3- Using a light microscope	Emerging (catching up): Identify and label parts of a light microscope.	1) State the name of the wheel used to focus the image. 2) Describe why would we focus the image. 3) State the name of the lens used to make an image larger. 4) Describe what is it called when the image is made larger. 5) Calculate the total magnification if the eyepiece lens has a x4 magnification and the objective lens x10.
	Achieving (keeping up): Describe how a light microscope can be used to produce clear images of cells.	
	Excelling (going beyond): Simple calculations of total magnification	

Y7 Biology: Cells

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4- Observing cheek cells	Emerging (catching up): - Make a slide of cheek cells. - View a cheek cell slide. - Describe how to view the cheek cell slide.	1) State the name of the staining chemical 2) Explain why we use the staining chemical. 3) State the name of the lens used to increase the magnification 4) State the name of the lens used to make the image clear. 5) Suggest one reason why we look at magnified images
	Achieving (keeping up): View a cheek cell slide.	
	Excelling (going beyond): Describe how to view the cheek cell slide.	
5- Observing Plant cells	Emerging (catching up): - Produce a slide of onion cells. - Observe the onion cells through a light microscope. - Draw the slide of onion cells that are being observed.	1) State the name of the chemical used to stain onion cells. 2) State the name of the slip put over the piece of onion. 3) Should you use a pen or a pencil when doing a scientific drawing. 4) Explain your choice. 5) State the name of the lens you look through in the microscope.
	Achieving (keeping up): Observe the onion cells through a light microscope.	
	Excelling (going beyond): Draw the slide of onion cells that are being observed.	
6- Specialised cells	Emerging (catching up): State the functions of specialised cells.	1) Describe the function of the Sperm cell. 2) There are lots of which organelle in a sperm cell. 3) Explain why there are lots of this organelle. 4) State the function of a root hair cell. 5) State the function of a red blood cell.
	Achieving (keeping up): Describe adaptations of specialised cells.	
	Excelling (going beyond): Explain the adaptations of specialised cells.	

Y7 Biology: Cells

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
7- Describe	Emerging (catching up): Define describe in science	1) Describe the organelles found in an animal cell.
	Achieving (keeping up): Answer simple describe questions.	2) Describe the differences between a plant cell and an animal cell.
	Excelling (going beyond): Answer more complex describe questions.	3) State the name of where the oxygen attaches to in a red blood cell. 4) State the name of where the slide goes on a microscope.

Y7 Biology: The digestive system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1- Levels of organisation	Emerging (catching up): Describe a multicellular organism	- Order the levels of organisation starting with the simplest. - State the definition of a cell. Give one example - State the definition of a tissue. Give one example. - State the definition of an organ. Give one example and the function. - State the definition of a multicellular organism.
	Achieving (keeping up): Describe the levels of organisation	
	Excelling (going beyond): Describe and identify different functions of organ systems	
2- The journey food takes in a human	Emerging (catching up): Define digestion.	- Describe the aim of the digestive system. - State the order of the organs that food passes through when you eat it. - Explain why humans eat food. - Sketch a labelled diagram of the digestive system. - State what your favourite type of food is and explain why.
	Achieving (keeping up): Describe the journey the food goes on during digestion.	
	Excelling (going beyond): Suggest the importance of digestion.	
3- What happens to food when it gets digested?	Emerging (catching up): Describe mechanical and chemical break down of food	- Describe the term mechanical break down of food. - Describe the term chemical break down of food. - State the organs where food is broken down mechanically. - State the organs where food is broken down chemically. - State the function of the large intestine in the digestive process.
	Achieving (keeping up): State the organs where the different types of digestion take place.	
	Excelling (going beyond): Use a model to describe digestion.	
4- The stomach and the small intestine	Emerging (catching up): State the function of the stomach and small intestine.	- State the name and role of the acid in the stomach. - Explain the role of the villi in the small intestine. - Explain why there are lots of capillaries in the villi. - Explain why the capillary walls are one cell thick. - Explain why these three adaptations are needed.
	Achieving (keeping up): Describe the function of the stomach and small intestine.	
	Excelling (going beyond): Describe adaptations of the small intestine.	

Y7 Biology: The digestive system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5- The role of the liver, gall bladder and pancreas in digestion	Emerging (catching up): Identify the location of the liver, gall bladder and pancreas.	1) State the name of the substance released from the liver that helps to digest fats and the organ where it acts. 2) State where the substance that helps to digest fats is stored. 3) State the name of the substances released from the pancreas that aid digestion and describe how they break down the food. 4) Describe the second function of the substance released from the liver (hint – linked to the stomach) 5) State the role of the gut bacteria in digestion.
	Achieving (keeping up): State the function of the liver, gall bladder and pancreas.	
	Excelling (going beyond) Explain how the three organs aid digestion.	
6- The diary of a fried chicken	Emerging (catching up): State the journey a cheese sandwich would take through our body.	1) Write a diary outlining the journey a fried chicken takes through the digestive process.
	Achieving (keeping up): Describe the journey a cheese sandwich would take through our body.	
	Excelling (going beyond) Explain the journey a cheese sandwich would take through our body.	

Y7 Biology: The cardiorespiratory system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1-The respiratory system	Emerging (catching up): Identify different organs and their location in the body	1) Complete the flow diagram to show the correct route that air takes to get into our cells: 2) Nasal cavity _____ cells 3) Describe the function of the alveoli 4) Explain how the structure of the trachea is important to mammals.
	Achieving (keeping up): Describe the functions of different organs	
	Excelling (going beyond): Describe the organisation of organisms	
2- Breathing and ventilation	Emerging (catching up): Describe how we inhale.	1) What do the intercostal muscles do? 2) What does the diaphragm do? 3) What happens to the volume of the chest space? 4) What happens to the pressure in the chest space? 5) What happens to the movement of air?
	Achieving (keeping up): Describe how we exhale.	
	Excelling (going beyond): Explain both of these processes.	
3- Modelling the lungs	Emerging (catching up): Describe a model of the lungs.	1) What did the balloons represent in the model? 2) What did the straw represent in the model? 3) What did the plastic bottle represent in the model? 4) Evaluate your model – what were the good bits and bad bits about the model? (eg how did it work well, and how did it not properly represent the system?) 5) Explain how the bottom balloon was very similar to the organ it represented.
	Achieving (keeping up): Design a model of the lungs.	
	Excelling (going beyond): Analyse a model of the lungs.	
4- Gas exchange	Emerging (catching up): Define gas exchange.	1) What is the meaning of gas exchange? 2) Name the two gases that get exchanged between the lungs and the blood 3) State the meaning of the term concentration? 4) Describe what happens to each of the two gases in gas exchange. You MUST use the following words: concentration, high, low, blood, alveoli.
	Achieving (keeping up): Describe how gas exchange takes place.	
	Excelling (going beyond): Describe adaptations of the alveoli for gas exchange.	

Y7 Biology: The cardiorespiratory system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5- How does human circulation work?	Emerging (catching up): State the parts of the human circulatory system.	1) State the key features of the human circulatory system 2) Describe the function of the heart 3) State the function of the arteries and the veins 4) What does the word 'oxygenated' mean? 5) Describe, in detail, the journey that blood takes around the body.
	Achieving (keeping up): Describe how blood transports nutrients around the body	
	Excelling (going beyond): Explain the importance of the circulatory system on our survival	
6- The Mammalian Heart	Emerging (catching up): Label the chambers and blood vessels attached to the heart	1) State the names of the 4 heart chambers 2) State the names of two major veins attached to the heart 3) State the function of the heart valves. 4) Which side of the heart carries oxygenated blood? 5) Why is the wall of the left ventricle thicker than the wall of the right ventricle?
	Achieving (keeping up): Identify unknown parts of the heart from diagrams and state their relevance	
	Excelling (going beyond): Explain the relevance of other features of the heart, including the valves and the septum	
7- Heart dissection	Emerging (catching up): Carry out a safe dissection of the heart	1) Question – Look at the drawing of a heart. Describe the errors that the student has made to this drawing
	Achieving (keeping up): Dissect a heart and identify the key anatomical features	
	Excelling (going beyond): Dissect and draw a labelled diagram of the internal heart structures, including chambers and blood vessels	

Y7 Biology: The cardiorespiratory system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
8- What do arteries and veins look like?	Emerging (catching up): Identify arteries and veins from a diagram.	- Compare the structure of an artery to the structure of a vein [4]. - Can you come up with three more comparisons. Make sure you use comparative language (for example thicker/thinner).
	Achieving (keeping up): Compare the structure of an artery to that of a vein	
	Excelling (going beyond): Explain how the structure of arteries relates to their structure	
9- What is the blood made of?	Emerging (catching up): Label the chambers and blood vessels attached to the heart	- State the names of the 4 heart chambers - State the names of two major veins attached to the heart - State the function of the heart valves. - Which side of the heart carries oxygenated blood? - Why is the wall of the left ventricle thicker than the wall of the right ventricle
	Achieving (keeping up): Identify unknown parts of the heart from diagrams and state their relevance	
	Excelling (going beyond): Explain the relevance of other features of the heart, including the valves and the septum	
10- The Cardiorespiratory System	Emerging (catching up): Describe the overall function of the respiratory system and the circulatory systems	- Which two body systems are involved in moving oxygen around the body - Describe what happens to your body when you exercise. - What does our body use energy for, and where does this energy come from? - Explain the importance of getting more oxygen into the body when you exercise. - Extension: Suggest what could happen to your body if you cannot get enough oxygen in when you exercise.
	Achieving (keeping up): Describe the overall function of the respiratory system and the circulatory systems	
	Excelling (going beyond): Describe how the respiratory and circulatory systems work together to maximise the amount of oxygen that is taken into our cells for respiration	

Y7 Biology: The cardiorespiratory system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
11- The effect of exercise on heart rate and breathing rate	Emerging (catching up): Describe how to measure a person's heart rate and breathing rate	1) Describe how to measure your heart rate 2) Describe how to measure your breathing rate. 3) Which of the two is easier to measure, and why?
	Achieving (keeping up): Plan an experiment to measure how exercise effects a person's heart rate and breathing rate	
	Excelling (going beyond): Plan a fair investigation to measure how intensity of exercise can affect a person's heart rate and breathing rate	
12- The effect of exercise on heart rate and breathing rate	Emerging (catching up): Carry out an investigation into how exercise effects heart rate and breathing rate	1) Which exercise caused you to have the highest heart rate? Why do you think this is? 2) Did you notice any patterns between the results for heart rate and breathing rate? 3) Can you think of any improvements we could have made to our investigation?
	Achieving (keeping up): Record your results from the investigation accurately.	
	Excelling (going beyond): Suggest improvements to the investigation.	
13 - The effect of exercise on heart rate and breathing rate	Emerging (catching up): State the results from our investigation and draw a bar graph.	1) Which exercise caused you to have the biggest change in heart rate? 2) Describe the changes in our body when we exercise.
	Achieving (keeping up): Use collected data to plot bar graphs and describe the information that they show	
	Excelling (going beyond): Represent data scientifically and explain how changes in heart rate and breathing rate and link to our body's increased demand for oxygen	

Y7 Biology: The musculoskeletal system

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1- The skeleton	Emerging (catching up): - State the four functions of the skeleton. - Describe the four functions of the skeleton. - Explain some functions of the skeleton.	- State the names of the three bones that allow humans to stand upright. - State the names of the three organs the ribcage protects. - State the names of the two bones that allow movement at the shoulder joint. - State the names of the two types of cells made in the bone marrow. - State the function of the two types of cells made in the bone marrow.
	Achieving (keeping up): Describe the four functions of the skeleton.	
	Excelling (going beyond): Explain some functions of the skeleton.	
2- Joints and movement	Emerging (catching up): State the definition of a joint.	- State the function of a joint. - State the function of the cartilage. - State the function of a hinge joint and give one example. - State the function of a pivot joint and give one example. - State the function of a ball and socket joint and give one example.
	Achieving (keeping up): Describe three examples of joints.	
	Excelling (going beyond): Describe the function of cartilage.	
3- Muscles and movement	Emerging (catching up): State the definition of a muscle.	- State the function of a tendon. - Describe how the bicep and triceps work together to move your arm downwards (extend). - Describe the term antagonistic muscle pair. - Describe why it is important to understand how muscles work. - State one job linked to understanding how muscles work.
	Achieving (keeping up): State the definition of a tendon.	
	Excelling (going beyond): Explain how an antagonistic muscle pair works together to move.	
4- Chicken wing dissection	Emerging (catching up): Carry out a chicken wing dissection.	- Draw a labelled diagram of a chicken wing. - Compare the chicken wing to a human arm. - State one safety feature when carrying out a chicken wing dissection. - Explain why dissections are useful in science.
	Achieving (keeping up): Identify muscles in a chicken wing.	
	Excelling (going beyond): Link the antagonistic muscle pair to chicken wing movement.	

How is your progress measured in class in **Science** in Spring Term 1?

Spring 1: Becoming a Chemist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response	
In class assessment (recall, application, how Science works)	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each.	
Emerging	Achieving	Excelling
Particle Model I can draw the particle model for the 3 states of matter I can name all the names of the changes of states of matter I can define gas pressure and diffusion I can describe the definition of density Separating Mixtures I can recall the difference between pure substances and mixtures I can recall the 4 separation techniques and what each one separates	Particle Model I can describe differences in the particle model of the 3 states of matter I can describe how changing states of matter effects the particle model I can describe how gas particles cause pressure using the particle model I can relate the density definition to the particle model Separating Mixtures I can describe the structure of solutions of mixtures I can describe how to carry out each separation technique in the lab	Particle Model I can explain the differences in the particle model of the 3 states linking to temperature I can predict states of substances at different temperatures I can explain who diffusion takes place at different rates in different states of matter I can plan an investigation to calculate density of objects I can explain temperature effects solubility of solute in a solvent I can analyse results from chromatography and explain them

How is your progress measured in class in **Science** in Spring Term 1 (catch up)?

Spring 1: Becoming a Chemist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Particle Model I can label the particle model for the 3 states of matter I can spell the names of the changes of states of matter I can label diagrams for gas pressure and diffusion I can identify objects in an order of density Separating Mixtures I can identify substances as pure or mixtures I can identify and spell basic separation equipment	Particle Model I can draw the particle model for the 3 states of matter I can name all the names of the changes of states of matter I can define gas pressure and diffusion I can describe the definition of density Separating Mixtures I can recall the difference between pure substances and mixtures I can recall the 4 separation techniques and what each one separates	Particle Model I can describe differences in the particle model of the 3 states of matter I can describe how changing states of matter effects the particle model I can describe how gas particles cause pressure using the particle model I can relate the density definition to the particle model Separating Mixtures I can describe the structure of solutions of mixtures I can describe how to carry out each separation technique in the lab

How is your progress measured in class in **Science** in Spring Term 2?

Spring 2: Becoming a Chemist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
In class assessment (recall, application, how Science works)	A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Periodic Table I can recall the definitions of groups and periods, describing how elements are arranged in the periodic table I can recall the names and properties of elements in group 1, 7 and 0 I can construct and analyse bar charts to find trends and anomalies Atoms, Elements and Compounds I can recall the definitions for an atom, element, and compound I can draw diagrams for elements, compounds and mixtures	Periodic Table I can recall properties of metal and non-metals and be able to compare them. I can explain the trends in properties in elements in group 1 and 7 I can find anomalies and trends from data sets Atoms, Elements and Compounds I can use chemical symbols to name elements and compounds using the periodic table I can name compounds from their formulae	Periodic Table I can plan an investigation for how to test for a metals or non-metal in the lab I can describe and predict results of reactions of group 1 elements with oxygen and water I can understand and construct word equations for displacement reactions Atoms, Elements and Compounds I can describe differences between molecules and compounds I can recall polymer definition and describe impacts of them

How is your progress measured in class in **Science** in Spring Term 2 (catch up)?

Spring 2: Becoming a Chemist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Periodic Table I can spell groups, periods and certain elements on the periodic table I can recall and spell the names of elements in group 1, 7 and 0 I can complete an unfinished bar chart and make a tally chart Atoms, Elements and Compounds I can spell the definitions for an atom, element, and compound I can label diagrams of elements, compounds and mixtures	Periodic Table I can recall the definitions of groups and periods, describing how elements are arranged in the periodic table I can recall the names and properties of elements in group 1, 7 and 0 I can construct and analyse bar charts to find trends and anomalies Atoms, Elements and Compounds I can recall the definitions for an atom, element, and compound I can draw diagrams for elements, compounds and mixtures	Periodic Table I can recall properties of metal and non-metals and be able to compare them. I can explain the trends in properties in elements in group 1 and 7 I can find anomalies and trends from data sets Atoms, Elements and Compounds I can use chemical symbols to name elements and compounds using the periodic table I can name compounds from their formulae

Y7 Chemistry: Particle Model

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) Be able to draw the 3 states of matter as a particle diagram	1) Describe the arrangement of the particles in the liquid state. 2) Describe the movement of the gas particles in the gas state. 3) Describe the arrangement of the particles in the solid state. 4) Describe one difference between the arrangement of particles in the solid state and the gas state. 5) Describe one difference between the movement of the particles in the gas state and the liquid state.
	Achieving (keeping up) Describe differences between the three states of matter.	
	Excelling (going beyond) Explain the differences between the three states of matter.	
2	Emerging (catching up) Recall properties of each state of matter	1) State an order of the strength of the forces of attraction between the three states of matter, going from strongest to weakest. 2) Explain why the particles in a gas move randomly in all directions. 3) Use the diagram to explain why a gas can be compressed. 4) State the names of the two states of matter where particles can flow. 5) State the name of the state of matter where particles can be compressed.
	Achieving (keeping up) Describe how to change between the states of matter	
	Excelling (going beyond) Explain how the particle model links to the properties of the three states of matter.	
3	Emerging (catching up) Be able to carry out a bunsen burner practical safely in the lab	1) Describe how to change state from water (liquid) to steam (gas). 2) Explain how the water (liquid) has changed state to steam (gas). 3) Suggest how you would change state from water (liquid) into ice (solid). 4) Explain how the water (liquid) has changed state into the ice (solid). 5) State the temperature ice changes state into liquid water.
	Achieving (keeping up) Describe the changes that take place when changes of state happen	
	Excelling (going beyond) Explain the changes take place during changes of state.	
4	Emerging (catching up) Use key phrases to discuss changing state.	1) State the name for a gas changing state into a liquid. 2) Explain the term evaporation. 3) Explain the term physical change of state. 4) Describe how to change liquid water into solid ice. 5) Describe the term sublimation.
	Achieving (keeping up) Link key phrases to changes of state.	
	Excelling (going beyond) Explain the difference between evaporation and boiling.	

Y7 Chemistry: Particle Model

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) State the importance of temperature and the states of matter.	1) A substance has a melting point of 1°C and boiling point of 125°C. What state will it be in at room temperature. 2) A substance has a melting point of 40°C and boiling point of 130°C. What state will it be in at room temperature. 3) A substance has a melting point of -150°C and boiling point of -20°C. What state will it be in at room temperature. 4) What state is oxygen in at room temperature. 5) What state is water in at room temperature.
	Achieving (keeping up) Use temperatures to predict the states of substances.	
	Excelling (going beyond) Determine the states of substances based on their temperature.	
6	Emerging (catching up) State the definition of diffusion.	1) Explain why diffusion can take place in gases. 2) Explain how gas pressure is caused.
	Achieving (keeping up) Describe the term gas pressure.	
	Excelling (going beyond) Explain the term gas pressure	
7	Emerging (catching up) Explain the term density.	1) Explain which has the highest density out of A and B. (3) 2) State the order of density of the three states of matter, starting with the highest density. (1)
	Achieving (keeping up) Analyse the density of different objects.	
	Excelling (going beyond) Use density to analyse objects.	
8	Emerging (catching up) State the definition of explain.	1) Explain why heating a solid to its melting point changes the arrangement of the particles from a regular to irregular arrangement. (2) 2) Explain the difference between boiling and evaporation. (2) 3) Explain why solid iron has a higher density than solid polystyrene. (2)
	Achieving (keeping up) Produce a mind map.	
	Excelling (going beyond) Answer explain style questions.	

Y7 Chemistry: **Separating Mixtures**

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) State the definition of pure substances and mixtures	1) State an example of a pure substance and a mixture 2) Define a pure substance 3) State 3 physical properties of salt 4) State the definition of a solution. 5) Draw a labelled diagram of sugar being added to a beaker of water and dissolving. Label the solute and solvent.
	Achieving (keeping up) Identify pure substances and mixtures.	
	Excelling (going beyond) Describe the structure of solutions	
2	Emerging (catching up) Describe the structure of solutions	1) Define 'insoluble' 2) Describe the difference in physical properties of salt and sand 3) Describe how temperature affects solubility of a solute 4) What is the name for a solution that has stopped dissolving a solute? 5) A student adds cold water to sand. The student then adds boiling water to sand. Explain the results that they will get
	Achieving (keeping up) Investigate which solids will form solutions	
	Excelling (going beyond) Describe how amount of solute and temperature affect solubility	
3	Emerging (catching up) Carry out filtration practical safely	1) Draw a labelled diagram for the sand filtration. Label the filter paper, funnel, beaker, residue, filtrate, and conical flask. 2) Explain why the sand and water could be separated by filtration, but the salt and water could not. (2) Keywords – soluble and insoluble.
	Achieving (keeping up) Carry out evaporation practical safely	
	Excelling (going beyond) Describe why filtration and evaporation are used for different mixtures	
4	Emerging (catching up) Plan your own method for separating a mixture	You have a mixture of salt and sand, you need to separate this mixture so the solid sand and solid salt remain. 1) Write a method with three steps to separate the mixture of salt and sand, and justify why you have carried out each step
	Achieving (keeping up) Justify the reasons and selections for the parts of your method	
	Excelling (going beyond) Understand what equipment should be used for each step of the practical	

Y7 Chemistry: **Separating Mixtures**

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) Carry out the method for separating a mixture of salt and sand	1) State the two key steps in the first part of separating a mixture of salt and sand. (dissolving) 2) State the two key steps in the second part of separating a mixture of salt and sand (filtration). 3) State the three key steps in the third part of separating a mixture of salt and sand. (evaporation).
	Achieving (keeping up)	
	Excelling (going beyond)	
6	Emerging (catching up) Recap state changes involved in liquids and gases	1) What are the two state changes involved in distillation, in the correct order? 2) Why does the water change state before the dissolved solutes? 3) What is the purpose of the water jacket (water in and water out)? 4) Describe what happens to the solution when it is heated by the Bunsen burner
	Achieving (keeping up) Describe the process of distillation	
	Excelling (going beyond) Explain how the process of distillation works including state changes	
7	Emerging (catching up) Understand what chromatography separates	1) Draw a labelled chromatography diagram. 2) State what the line near the bottom of the paper must be drawn in. 3) State what is put into the beaker. 4) How many spots will an impure substance produce.
	Achieving (keeping up) Describe the process of chromatography	
	Excelling (going beyond) To be able to analyse chromatograms	
8	Emerging (catching up) Carry out the process of chromatography to solve an investigation	1) State a 5 step method for the chromatography practical, in order. 2) Explain why the line near the bottom is drawn in pencil 3) State two uses of chromatography.
	Achieving (keeping up) To be able to recall the method of chromatography	
	Excelling (going beyond) To justify each step of the practical	

Y7 Chemistry: Periodic Table

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) State the definition of groups and periods of the Periodic Table	1) State the definition of a period in the periodic table. 2) State the definition of a group in the periodic table. 3) Is Oxygen a metal or a non-metal? 4) Name the element that has the symbol Ca. 5) What is the symbol of the ninth element.
	Achieving (keeping up) Identify metals and non-metals	
	Excelling (going beyond) Describe how elements are arranged in the Periodic table	
2	Emerging (catching up) Name and identify the elements in group 1	1) As you go down group 1 suggest what happens to the reactivity. 2) When bubbling is present in a chemical reaction, what does it suggest? 3) Describe two common observations that all the alkali metal chemical reactions with water have in common. 4) Describe the colour change when universal indicator is added to the solution, after the reaction of alkali with water. 5) Predict if Caesium will be more or less reactive than Francium. Justify your choice.
	Achieving (keeping up) Observe and describe reactions with group 1 metals	
	Excelling (going beyond) Suggest explanations for differences in observed results for group 1 reactions	
3	Emerging (catching up) Predict trends of Group 1 elements	1) State the trend in melting point as you go down the alkali metals. 2) Predict the melting point range of the element at the bottom of alkali metals, Francium. (1) 3) Plot this data onto the bar graph. (1) 4) Describe two physical properties of the alkali metals. (2)
	Achieving (keeping up) Explain the trend of Group 1 metals	
	Excelling (going beyond) Plot a graph trends	
4	Emerging (catching up) State the physical properties of Group 7 elements	1) State the name of the halogen with the highest boiling point 2) State if the halogens can conduct electricity. 3) State the colour of Bromine 4) What colour in Fluorine? 5) Explain the trend in boiling points in and melting points in Group 7 elements?
	Achieving (keeping up) Describe data trends for Group 7 elements	
	Excelling (going beyond) Plot a graph showing the trends for Group 7 elements	

Y7 Chemistry: Periodic Table

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) State the chemical properties of group 7	1) Which halogen is the most reactive? 2) Describe the trend in reactivity as you go down group 7? 3) What is a displacement reaction? 4) Why does chlorine displace bromine? Copy and complete this reaction 5) Fluorine + Copper iodide → _____ + _____
	Achieving (keeping up) Describe the trends in reactivity for group 7	
	Excelling (going beyond) Investigate displacement reactions of group 7 elements	
6	Emerging (catching up) State the physical properties of group 0	1) State the name of group 0. 2) State the names and symbols of three noble gases. 3) State the trend in boiling point as you go down group 0. 4) State what happens to the reactivity as you go down group 0. 5) State why helium balloons can float in air.
	Achieving (keeping up) Describe the reactivity properties of group 0	
	Excelling (going beyond) State uses of the Noble gases	
7	Emerging (catching up) Construct a bar chart and analyse a trend	1) Describe the trend in melting point between Na and Si. (1) 2) Describe the trend in melting point between Si and Ar. (3 points) 3) State the element that is the anomaly.
	Achieving (keeping up) Define anomaly	
	Excelling (going beyond) Identify an anomaly from a set of data	

Y7 Chemistry: Atoms, elements and compounds

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) State the definition of an atom and an element.	1) State the definition of an atom 2) State the definition of an element. 3) Draw a diagram showing 2 atoms of Magnesium that are separate. 4) Draw a diagram showing 2 atoms of Nitrogen joined together. 5) Draw a diagram showing 1 atom of Potassium, 6 atoms of Gold that are joined together.
	Achieving (keeping up) Name different elements based on their symbols.	
	Excelling (going beyond) Identify metals and non-metals.	
2	Emerging (catching up) State the definition of a compound.	1) State the definition of a compound. Draw..... 1) One lithium atom and one iodine atom joined together. 2) One barium atom and two chlorine atoms joined together. 3) Two sodium atoms and one oxygen atom joined together.
	Achieving (keeping up) Draw diagrams for compounds.	
	Excelling (going beyond) State the names of simple compounds.	
3	Emerging (catching up) State the definition of a mixture and a molecule	Draw a particle diagram and name the elements or compounds for the following..... 1) Two oxygen atoms joined together, 1 carbon atom joined with 2 oxygen atoms, and 1 sulphur atom joined with 3 oxygen atoms. 2) Two nitrogen atoms joined together, 1 sodium atom joined with 1 chlorine atom, and 1 magnesium atom joined with 2 bromine atoms. 3) Draw your own particle diagram and name the elements/compounds. It must consist of 2 different elements and 2 different compounds.
	Achieving (keeping up) Name different elements based on their symbols.	
	Excelling (going beyond) Draw diagrams for more complex mixtures	
4	Emerging (catching up) Name simple compounds.	1) Name the following compounds. LiOH BeSO ₄ NaNO ₃ KOH SrCO ₃ CaSO ₄ Extension – Write the formula of your own compounds and name them.
	Achieving (keeping up) Name more complex compounds.	
	Excelling (going beyond) Draw particle diagrams for more complex compounds.	

Y7 Chemistry: Atoms, elements and compounds

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) Describe a polymer.	1) State the definition of a polymer. 2) State the two elements found in hydrocarbons. 3) State two uses of polymers and give an example for each. 4) State a disadvantage of synthetic polymers. 5) State one example of a natural polymer and its use.
	Achieving (keeping up) Discuss the impacts of polymers on the environment.	
	Excelling (going beyond) Discuss natural polymers.	

How is your progress measured in class in **Science** in Summer Term?

Summer term 1 : Becoming a Physicist

Multiple Choice Quiz	A fifteen-minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
In class assessment (recall, application, how Science works)	A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Energy I can name different fuels I can state where electricity is formed Heating & cooling I can state the direction that thermal energy flows	Energy I can describe how renewable and non-renewable fuels are formed I can describe all the steps involved in generating electricity Heating & cooling I can describe how energy is transferred via conduction, convection, and radiation	Energy I can evaluate and the pros and cons of using renewable and non – renewable fuels I can evaluate the impact of generating electricity using different fuels Heating & cooling I can explain how to increase the effectiveness of thermal energy transfers in everyday situations

How is your progress measured in class in **Science** in Summer Term (catch up)?

Summer term 1 : Becoming a Physicist	
Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Energy I can identify different fuels from diagrams I can state places where electricity is used Heating & cooling I can describe the term thermal energy	Energy I can name different fuels I can state where electricity is formed Heating & cooling I can state the direction that thermal energy flows	Energy I can describe how renewable and non-renewable fuels are formed I can describe all the steps involved in generating electricity Heating & cooling I can describe how energy is transferred via conduction, convection, and radiation

How is your progress measured in class in **Science** in Summer Term?

Summer term 2 : Becoming a Physicist

Multiple Choice Quiz	A fifteen-minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
In class assessment (recall, application, how Science works)	A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Energy transfers I can recall the conservation law of energy I can identify useful and wasted energy Speed I can use arrows on diagrams to represent forces I can state the formula for calculating speed.	Energy transfers I can apply the conservation of energy law to simple energy transfers I can rearrange the efficiency equation to find input energy and useful energy Speed I can describe the effect of balanced and unbalanced forces on an object I can rearrange the speed equation to find distance and time	Energy transfers I can analyse energy transfers, with multiple steps highlighting the four energy transfer pathways I can convert between units when using efficiency equation. Speed I can explain the motion of objects due to the forces acting upon it I can convert between units when using the speed equation.

How is your progress measured in class in **Science** in Summer Term (catch up?)

Summer term 2 : Becoming a Physicist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Energy transfers I can state the importance of energy in science I can identify useful and wasted energy on diagrams Speed I can add arrows to diagrams to show forces I can state the formula for calculating speed	Energy transfers I can recall the conservation law of energy I can identify useful and wasted energy Speed I can use arrows on diagrams to represent forces I can calculate speed	Energy transfers I can apply the conservation of energy law to simple energy transfers I can rearrange the efficiency equation to find input energy and useful energy Speed I can describe the effect of balanced and unbalanced forces on an object I can rearrange the speed equation to find distance and time

Y7 Physics: Energy

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): Identify different fuels	1) How can we describe energy? 2) What is the law of conservation of energy? 3) What is the unit of energy? 4) How do we get energy from fuels?
	Achieving (keeping up): - Describe the functions of different fuels - Describe how fuels are source of energy	
	Excelling (going beyond): Explain the importance of fuels for the future	
2	Emerging (catching up) Define what non-renewable fuels are	1) What form of energy is stored in fossil fuels? 2) Why are coal, oil and gas called fossil fuels 3) Explain how coal is formed
	Achieving (keeping up): Describe how fossil fuels are formed	
	Excelling (going beyond): Evaluate the pros and cons of non-renewable fuels	
3	Emerging (catching up): State how fossil fuels are used to generate electricity	1) Where is main electricity generated? 2) Describe how a power station works 3) If you burn coal what is the chemical energy transferred to ?
	Achieving (keeping up): Describe how fossil fuels are used to generate electricity	
	Excelling (going beyond): Evaluate the use of fossil in generating electricity	
4	Emerging (catching up): Identify the main renewable energy resources	1) What does renewable mean 2) Which energy resources are infinite 3) Where do all renewable energy resources come from?
	Achieving (keeping up): - Explain the term “renewable energy resource” - Describe how we use renewable energy resources	
	Excelling (going beyond): Explain the importance of renewable fuels for the future	
5	Emerging (catching up): Describe how renewable energy resources are used to generate electricity	1) What is the difference between solar cells and solar panel? 2) How do water waves generate electricity? 3) How does wind generate electricity? 4) How does biomass generate electricity
	Achieving (keeping up): Describe how we use renewable energy resources to generate electricity	
	Excelling (going beyond): Explain why hydrogen is a promising fuel for the future	

Y7 Physics: Energy

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
6	Emerging (catching up) • Define electrical power	1) Calculate the power of a light bulb that uses 40J of electricity in 4 seconds. 2) Calculate the power of a toaster that uses 200J of electricity in 20 seconds. 3) Calculate the power of a digger who performs 12000J of work in 6 seconds. 4) Calculate the power of a car that uses 6600J of chemical energy in 3 seconds. 5) Calculate the power of a car that uses 12000kJ of chemical energy in 6 seconds.
	Achieving (keeping up): • Calculate power ratings for common electrical appliances	
	Excelling (going beyond): • Compare power ratings for common electrical appliances	
7	Emerging (catching up) • Define domestic electricity	1) How do the energy companies work out the cost of electricity used? 2) How do you calculate a unit of energy (kWh) 3) How do you convert minutes into hours? 4) How do you convert seconds into hours?
	Achieving (keeping up): • Compare the energy usage and cost of running different home devices. • Calculate cost of electricity (domestic bills)	
	Excelling (going beyond): • How can you reduce electricity costs	
8	Emerging (catching up) • Define energy efficiency	1) Evaluate the best way Cardinal Pole can increase energy efficiency
	Achieving (keeping up): • Discuss the energy efficiency of Cardinal Pole	
	Excelling (going beyond): • Evaluate the best way to increase the energy efficiency of Cardinal Pole	

Y7 Physics: Heating and cooling

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) State the difference between temperature and thermal energy	- What is the name of the instrument we use to measure temperature? - What does thermal energy depend on? - True or False: Temperature can be understood as a measurement of the motion of the particles only. - What is the name of the thermal energy flow? - A flow of thermal energy (heat) is moving out of a body to its surroundings. The temperature of this body is higher or lower than the environment? Why
	Achieving (keeping up): - State what the thermal energy of an object depends on. - Explain, in terms of thermal energy transfer, why objects change their temperature.	
	Excelling (going beyond): Explain the difference between a steam burn and a burn from an iron	
2	Emerging (catching up) State the 3 different pathways in which thermal energy transfer can take place.	- What are fluid substances? - Heat transfer by convection can only take place on fluid substances. Why? - True or False: the heat transfer by infrared radiation can only take place in vacuum. - An iron box is over a wooden table. They are in thermal equilibrium (they are at the same temperature). If you touch them with bare hands, the iron box seems to be colder than the table. Why? - How does the heat emitted by the Sun reaches Earth?
	Achieving (keeping up): - Describe and sketch diagrams to show how convection currents occur. - Describe what is infrared radiation and how heat is transferred from the Sun to Earth	
	Excelling (going beyond): Explain the 3 different pathways in which thermal energy transfer can take place in everyday situations	
3	Emerging (catching up) Describe how a thermal insulator can reduce energy transfer.	- Why is the ampoule inside a thermos bottle made of glass? - Explain why the walls are double with vacuum in between. - True or False: These glass ampoule walls are covered with a reflective layer to avoid heat transfer by convection. - Explain how the thermal insulation on pipes of air conditioning systems avoid water dripping. - Why are the pipes of air conditioning systems covered with a reflective material?
	Achieving (keeping up): Compare insulation methods in terms of conduction, convection and radiation	
	Excelling (going beyond): Explain how a thermos bottle work and why the conductors of an air conditioning system are thermal insulated	

Y7 Physics: Energy transfer

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) State what energy is	- What is a kinetic energy stores? - What is nuclear energy store? - Give an example of elastic energy store - What is Gravitational Potential energy store? - Give an example of magnetic energy store
	Achieving (keeping up): - Identify different energy stores - Give examples of different energy stores	
	Excelling (going beyond): Explain the importance of energy stores e.g how fuels work	
2	Emerging (catching up) State the conservation law of energy	- Describe the principle of conservation of energy. - State the unit of energy. - A book is on a shelf and has an initial gravitational potential energy store of 30 J. It then falls off the shelf. State how much energy is in the kinetic energy store by the time the book reaches the ground
	Achieving (keeping up): - Know that energy is a quantity that can be quantified and calculated - Apply the conservation law of energy	
	Excelling (going beyond): Application of understanding of energy to explain everyday physical process	
3	Emerging (catching up) State how energy is transferred between stores	- What are the four energy pathways - The steam train uses coal to produce steam to power it's engines which produces motion. What energy transfers are there involved? - How can energy be transferred?
	Achieving (keeping up): Identify the four pathways that bring about change between stores	
	Excelling (going beyond): Apply how energy is transferred between pathways	
4	Emerging (catching up) State what dissipation means	- What does dissipation mean? - What is meant by useful energy? - What is meant by wasted energy? - Describe how energy is dissipated in a range of everyday situations. - Identify useful and wasted energy from simple energy transfers
	Achieving (keeping up): - identify useful and wasted energy in energy transfers - Describe how energy is dissipated in a range of situations	
	Excelling (going beyond): Evaluate when dissipation of energy is useful	

Y7 Physics: Energy transfer

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) Identify energy transfers that everyday electrical appliances are designed to bring out	1) What is electrical power? 2) What is meant by power ratings? 3) What does energy efficient mean? 4) What do energy labels show? 5) How do you calculate efficiency?
	Achieving (keeping up): Give examples of energy transfers that everyday electrical appliances are designed to bring out	
	Excelling (going beyond): Compare power ratings of electrical appliances	
6	Emerging (catching up) State what input and output energy is	1) Draw Sankey diagrams and calculate efficiency from the diagrams
	Achieving (keeping up): - Identify input and output energy - Calculate the useful energy and the amount dissipated, given values of input and output energy	
	Excelling (going beyond): Evaluate why	
7	Emerging (catching up) Describe how to use efficiency to select electrical appliances	1) Justify the selection of electrical appliances using calculations of efficiency
	Achieving (keeping up): - Calculate the useful energy and the amount dissipated, given values of input and output energy - Justify the selection of electrical appliances using calculations of efficiency	
	Excelling (going beyond):	

Y7 Physics: Forces and speed

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) - State what a force is - Identify different forces	1) What is a force? 2) What is the unit for force? 3) How do you represent forces 4) Identify some forces 5) What two categories can you put all forces in?
	Achieving (keeping up): - Represent forces using arrows - Describe forces as contact or non-contact	
	Excelling (going beyond): What causes everyday forces	
2	Emerging (catching up) State what is meant by balanced and unbalanced forces	1) What happens to an object of the forces acting on the object are balanced? 2) What happens to an object if the forces acting on the object are unbalanced? 3) What is the resultant force? 4) What does accelerating mean? 5) What does decelerating mean?
	Achieving (keeping up): - Describe what happens when the resultant force is not zero - Use force diagrams to show balanced and unbalanced	
	Excelling (going beyond): - Calculate the resultant force - Analyse the impact of the resultant force	
3	Emerging (catching up) State the formula for speed with units	1) What is speed? 2) How do you calculate speed? 3) What are the units for speed? 4) Write down the relationship between speed, distance and time 5) Make calculations of speed
	Achieving (keeping up): - Apply the relationship between speed, distance and time - Describe the link between speed and time	
	Excelling (going beyond): Apply understanding that speed is a scalar quantity and velocity is a vector	
4	Emerging (catching up) Select correct apparatus to measure distance and time	1) What equipment would you use to measure speed? 2) Follow instructions to carry out the practical 3) Collect data accurately 4) Calculate the mean
	Achieving (keeping up): - Set up a practical by following a method - Collect data accurately and calculate the mean using three repeats	
	Excelling (going beyond): Compare manual and automated methods that can be used to measure speed	

Y7 Physics: Forces and speed

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) Label the x axis with the independent variable and the y axis with the dependent variable	1) When plotting graphs the variable that you plot on the x axis is ? 2) When plotting graphs the variable that you plot on the x axis is ? 3) When scaling your graph the axis must always start at zero 4) A bar chart is only drawn when 5) The purpose of graphs is to
	Achieving (keeping up): - Decide which numbers to start and finish with on the x and y axis - Draw line graphs to display relationships	
	Excelling (going beyond):	
6	Emerging (catching up) State the formula for speed	Interpret distance using a time graph
	Achieving (keeping up): - State what a straight diagonal line, horizontal line and curve line mean on a distance – time graph - Calculate speed from a distance – time graph	
	Excelling (going beyond): Analyse speed – time graphs	
7	Emerging (catching up) - State the value of g, (gravitational field strength) on Earth and the moon - Describe the difference between mass and weight	1) Explain the way in which an astronaut's weight varies on a journey to the moon 2) The size of the weight depends on the amount of ? 3) What is the difference between mass and weight 4) What the relationship between mass, weight and gravitational field strength 5) Calculate weight on different planets. 6) Explain why weight changes but mass remains the same on different planets
	Achieving (keeping up): - State the relationship between mass, weight and gravitational field strength - Calculate weight on different planets.	
	Excelling (going beyond): Explain why weight changes but mass remains the same on different planets	

Y8 Science

Becoming a physicist

Build circuits and electromagnets

How is our modern electronic world powered?

Big picture: Explain how current and charges provide electrical power to our homes and planet

Becoming a physicist

Collapsing cans

Testing objects in different liquids to see if it floats or sinks.

How is the Earth's climate changing?

Big picture: Explain climate change using different models and links to the Earth's structure and atmosphere

Becoming a chemist

Using chemical reactions to explain physical and chemical change.

Are chemical reactions permanent?

Big picture: Explain the difference between a physical and chemical change; be able to balance symbol equations

Becoming a chemist

Using thermometers to monitor temperature changes and explain endothermic and exothermic reactions

Becoming a chemist

Making cabbage indicator and copper sulphate salt

How do organisms interact in the world?

Big picture: Use real world examples to explain how organisms interact with their environment and the cycling of energy

Where do I come from?

Big picture: Identify the key areas of the body responsible for reproduction and describe how it works. Explain how genes are inherited and how it links to evolution, biodiversity and extinction

What happens when I become infected?

Big picture: Name the four different types of pathogens that cause infectious disease. Explain how the body fights pathogens, and the role of medicine and hygiene to prevent the spread of pathogens.

What happens when I have a poor diet?

Big picture: Identify the key food groups in a healthy diet, and explain how lack of these groups lead to deficiency diseases

Why does the same object float in some liquids and not others?

Explain how pressure changes in liquids and gases.

Becoming a chemist

Build a model of the Earth

How is energy transferred in a chemical reaction?

Big picture: Identify the key features of exothermic and endothermic reactions and explain how energy is stored, transferred and released.

Becoming a physicist

How to balance a see saw

Why is it harder to open a door without a handle?

Identify the key features of a moment, and calculate moments in different situations

Becoming a physicist

Reflection, refraction and making a pinhole camera

How do you see in the mirror?

Identify the key features of a transverse wave, anatomy of the eye and how both interact.

Becoming a physicist

Measuring the speed of sound

How do we hear sound?

Identify the key features of a longitudinal wave, anatomy of the ear and how both interact.

What are acids and alkalis?

Big picture: Know the difference between an acid and an alkali, in terms of indicator and pH scale; name the products of different neutralisation reactions.

Becoming a chemist

Using chemical reactions to explain metal reactivity and displacement.

What happens in a chemical reaction?

Big picture: Identify the products from various chemical reactions of metals with other non metals, and be able to write word equations

Becoming a biologist

Design food chains and food webs

Becoming a biologist

Extracting DNA from a strawberry

Becoming a biologist

A day in the life of a doctor: diagnosing some conditions based on symptoms

Becoming a biologist

Using chemicals to identify key food groups in different food samples

Y8 Science – Catch up

Becoming a physicist

Build circuits and electromagnets

How is our modern electronic world powered?

Describe how electricity is used and use some key terms

Becoming a physicist

Use pressure and forces to make objects float

Why does the same object float in some liquids and not others?

Describe the term pressure

How is the Earth's climate changing?

Describe the Earth's climate

Becoming a chemist

Carry out a more complex chemical reaction

Are chemical reactions permanent?

Use practical activities to identify changes as physical or chemical

How is energy transferred in a chemical reaction?

Use a thermometer to measure temperature change. Identify the reactions as exothermic or endothermic

Becoming a chemist

Carry out different reactions and describe what takes place

How do organisms interact in the world?

Big picture: Use the real world to describe the interactions between living organisms and their environment

Where do I come from?

Big picture: Learn about what humans have evolved from

What happens when I become infected?

Big picture: Spell and identify the different pathogens and symptoms if you get infected by them. How could you limit the spread of pathogens

What happens when I have a poor diet?

Big picture: Identify food groups and decide what happens if you do not have enough of a certain type of nutrient

Becoming a physicist

Investigate how to balance a seesaw

Why is it harder to open a door without a handle?

Use simple multiplication to calculate moments

Becoming a physicist

Describe reflection and refraction

How do you see in the mirror?

Describe light waves and use this to describe how we hear

Becoming a physicist

Describe how to measure speed

How do we hear sound?

Describe sound waves and describe how we hear

What are acids and alkalis?

Identify substances as acids or alkalis using indicator

Becoming a chemist

Describe what takes place when metals react with acids and your observations

What happens in a chemical reaction?

State simple word equations for reactions and describe what you see

Becoming a biologist

Design food chains and food webs

Becoming a biologist

Extract DNA from a strawberry

Becoming a biologist

Take on the role of a doctor and diagnose illnesses from symptoms

Becoming a biologist

Carry out food tests to identify different nutrients in foods

How is your progress measured in class in **Science** in Autumn Term 1?

Autumn: Becoming a Biologist

Malnutrition Quiz	A fifteen-minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
Malnutrition, health and how we make it worse topic test	A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Malnutrition I can define obesity, coronary heart disease and diabetes I can state the food tests and follow a method to carry out food tests How we make it worse I can recall effects of drugs, alcohol and smoking on the body I can define cancer and state the two types of tumours	Malnutrition I can describe the symptoms of obesity, coronary heart disease and diabetes I can describe steps for and carry out all food tests accurately How we make it worse I can describe the short-term and long-term effects of alcohol and smoking on the body I can describe malignant and benign tumours and describe the causes of cancer	Malnutrition I can explain how obesity, coronary heart disease and diabetes lead to I can outline details of all food tests with correct equipment and explanations for each step How we make it worse I can explain scientific mechanisms of how alcohol, drugs and smoking harm the body using scientific terms I can explain the causes of cancer

How is your progress measured in class in **Science** in Autumn Term 1 (catch up)?

Autumn: Becoming a Biologist

Malnutrition Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
Malnutrition, health and how we make it worse topic test	A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Malnutrition I can identify causes and symptoms of obesity, coronary heart disease and diabetes I can state some of the food tests and follow a method to carry out some of the food tests How we make it worse I can recall some effects of drugs, alcohol and smoking on the body I can define cancer and identify some general symptoms	Malnutrition I can define obesity, coronary heart disease and diabetes I can state the food tests and follow a method to carry out food tests How we make it worse I can recall effects of drugs, alcohol and smoking on the body I can define cancer and state the two types of tumours	Malnutrition I can describe the symptoms of obesity, coronary heart disease and diabetes I can describe steps for and carry out all food tests accurately How we make it worse I can describe the short-term and long-term effects of alcohol and smoking on the body I can describe malignant and benign tumors and describe the causes of cancer

How is your progress measured in class in **Science** in Autumn Term 2?

Autumn: Becoming a Biologist

Infectious Diseases Quiz	A fifteen-minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each. Section 1: Five multiple choice questions (MCQ's) Section 2: Five written retrieval questions Section 3: One extended written response
Infectious diseases and where do I come from assessment	• Malnutrition, • How we make it worse, • Infection and disease and • Where do I come from.

Emerging	Achieving	Excelling
Infectious diseases I can define pathogen and state the 4 examples I can recall treatments and preventions for diseases Where do I come from? I can define fertilisation and implantation I can define key terms DNA, gene, chromosome, genome and state where they are found	Infectious diseases I can describe how all 4 pathogens cause harm to the body I can describe the steps of how a vaccine works Where do I come from? I can outline each stage of foetal development (fertilisation to pregnancy) I can describe how genes are passed on and how genetic diseases can be caused	Infectious diseases I can explain how all 4 pathogens cause disease I can explain how a vaccine causes immunity and explain the steps using scientific knowledge Where do I come from? I can explain each stage of foetal development using correct scientific terms I can apply my knowledge of inheritance to predict genetic diseases using family trees

How is your progress measured in class in **Science** in Autumn Term 2?

Autumn: Becoming a Biologist

Interdependence assessment

40 mark topic test covering key areas

Emerging	Achieving	Excelling
Interdependence I can name different habitats and organisms that live there. I can state what food chains and food webs are. I can recall what is meant by the term adaptations I can name and label various parts of a flower, including where photosynthesis takes place.	Interdependence I can describe how ecosystems are organised, including interdependence. I can label and describe the various parts of food chains and food webs. I can identify the adaptations of prey and predators from pictures I can construct a word equation for photosynthesis and describe how the various parts of a flower are involved in photosynthesis and pollination	Interdependence I can explain how interdependence exists in a variety of ecosystems and how organisms occupy a niche. I can construct a food web from food chains and explain why they are representatives of an ecosystem. I can separate adaptations into structural, behavioural, and provide examples for each. I can describe how plants obtain raw materials for photosynthesis and how pollination links to interdependence

How is your progress measured in class in **Science** in Autumn Term 2 (catch up)?

Autumn: Becoming a Biologist

Infectious Diseases Quiz

Infectious diseases and where do I come from assessment

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Infectious diseases I can state examples of viruses and bacteria I can recall some treatments and preventions for diseases Where do I come from? I can label diagrams of fertilisation and implantation I can define key terms DNA, gene, chromosome, genome	Infectious diseases I can define pathogen and state the 4 examples I can recall treatments and preventions for diseases Where do I come from? I can define fertilisation and implantation I can state the order of organisation of DNA, gene, chromosome, genome and state where they are found	Infectious diseases I can describe how all 4 pathogens cause harm to the body I can describe the steps of how a vaccine works Where do I come from? I can outline each stage of foetal development (fertilisation to pregnancy) I can describe how genes are passed on and how genetic diseases can be caused

How is your progress measured in class in **Science** in Autumn Term 2 (catch up)?

Autumn: Becoming a Biologist

Interdependence assessment

A fifty minute summative assessment worth 40 marks.
10 marks of spelling
10 MCQ questions from the quiz
14 marks of level 1 and 2 questions
6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Interdependence I can describe a habitat and name some organisms that live there I can label parts of a food chain I can link adaptations of organisms on a model I can label parts of a flower	Interdependence I can name different habitats and organisms that live there. I can state what food chains and food webs are. I can recall what is meant by the term adaptations I can name and label various parts of a flower, including where photosynthesis takes place.	Interdependence I can describe how ecosystems are organised, including interdependence. I can label and describe the various parts of food chains and food webs. I can identify the adaptations of prey and predators from pictures I can construct a word equation for photosynthesis and describe how the various parts of a flower are involved in photosynthesis and pollination

Y8 Biology: Malnutrition and Health

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): Revisit the digestive system and recognise the organs involved in digestion	1) Give two ways that you can look after your digestive health 2) Describe some symptoms of an unhealthy digestive system 3) State 3 positive impacts of having a healthy digestive system
	Achieving (keeping up): Describe why having a healthy digestive system is important	
	Excelling (going beyond): Describe the factors that can make our digestive health worse	
2	Emerging (catching up): Revisit the circulatory system and recognise the anatomy of the system	1) Give two ways that you can look after your circulatory system 2) Describe some symptoms of an unhealthy circulatory system 3) Explain why having normal blood components is important in your health
	Achieving (keeping up): Describe why having a healthy circulatory system is important	
	Excelling (going beyond): Describe the factors that can make our circulation worse	
3	Emerging (catching up): Name the major food groups and have examples for each of them	Identify the food group responsible for the following functions: 1) Improve digestion 2) Provide and store energy 3) Growth and repair 4) Store energy, insulation and growth
	Achieving (keeping up): Describe the function of the food groups in our body	
	Excelling (going beyond): Explain the importance of the food groups in keeping our body healthy	
4	Emerging (catching up): Describe a balanced diet	1) How many grams of carbohydrates should a year 7 female have each day 2) How many grams of fat should a year 7 male have each day? 3) Which group of child has to eat the most food? 4) How much <u>more</u> protein should a 16 year old boy eat than a 10 year old boy? 5) How much <u>more</u> carbohydrate should a 17 year old girl eat than a 3 year old boy
	Achieving (keeping up): Use data to compare diets and suggest which are more balanced	
	Excelling (going beyond): Create a balanced diet using numerical values for food groups	

Y8 Biology: Malnutrition and Health

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): Describe the colour change when food molecules are present in food	1) What is the positive colour for the starch test? 2) What is the negative result colour for the biuret test? 3) Describe how to test a food sample for starch 4) Describe how to test a food sample for lipids
	Achieving (keeping up): Describe methods to carry out food tests	
	Excelling (going beyond): Describe how to carry out food tests and identify foods from the results of tests	
6	Emerging (catching up): State the causes for an unbalanced diet	1) Name four deficiency diseases, and describe the following for each one: - Causes - Symptoms - Changes need to diet
	Achieving (keeping up): Describe health issues of an unhealthy diet	
	Excelling (going beyond): To identify symptoms of an unbalanced diet	
7	Emerging (catching up): State the effects on the human body of consuming too much food	1) Define obesity 2) What causes a person to become obese 3) State two diseases that are linked to a person being obese 4) Calculate the BMI of a 165cm woman who has a mass 52kg
	Achieving (keeping up): Calculate BMI	
	Excelling (going beyond): Describe the effects of obesity on the body	
8	Emerging (catching up): Describe the importance of arteries on the human body	1) What is coronary heart disease? 2) What are the main causes and risk factors associated with CHD? 3) How do lifestyle choices like diet and exercise influence risk of CHD? 4) What are the CHD symptoms and diagnosis? 5) Describe the treatment options available for CHD, and how they work
	Achieving (keeping up): Describe how fat builds up in the body	
	Excelling (going beyond): Describe the effects of arteries becoming blocked	
9	Emerging (catching up): Define diabetes	1) Describe diabetes and the main types 2) Define insulin, and why is it important in the body? 3) What are the common symptoms of diabetes? 4) What lifestyle changes help manage Type 2 diabetes? 5) Why must people with diabetes monitor their blood sugar levels?
	Achieving (keeping up): Explain the difference between Type 1 and 2 diabetes	
	Excelling (going beyond): Discuss the diabetes on individuals and society	

Y8 Biology: How can we make it worse?

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): State the definition of alcohol.	1) State the name of the drug found in alcohol. 2) Describe the effect of alcohol on the body. 3) Suggest why you should not drink alcohol and drive a car. 4) Describe the potential effect on the liver with long term overuse of alcohol. 5) Describe one potential effect on a baby, when a mother drinks alcohol when pregnant.
	Achieving (keeping up): Describe the effects of alcohol on the body	
	Excelling (going beyond): Suggest the long-term impact of over consumption of alcohol on the body	
2	Emerging (catching up): State the definition of a drug	1) State the definition of a medicinal drug and give an example 2) State the definition of a recreational drug. 3) State one example of a legal recreational drug and give the effect 4) State one example of an illegal recreational drug and give the effect 5) State the definition of addiction and withdrawal symptoms
	Achieving (keeping up): State examples of drugs and classify them as legal/illegal and medicinal/recreational	
	Excelling (going beyond): Describe effects of different drugs	
3	Emerging (catching up): State the different chemicals in cigarette smoke	1) State the name of the substance found in cigarettes 2) Describe the effect of nicotine on the body. State one disease it is associated with 3) Describe the effect of tar on the body. State one disease it is associated with. 4) Describe the effect of carbon monoxide on the body. State one disease it is associated with. 5) Describe the term passive smoking and state one effect of it.
	Achieving (keeping up): State the effects of chemicals found in cigarette smoke	
	Excelling (going beyond): Suggest some long-term effects of smoking	

Y8 Biology: How can we make it worse?

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	Emerging (catching up): Describe the term cancer.	- State two reasons why mitosis takes place - State the name of a tumour that is cancerous. - State the name of the type of therapy where chemicals are used to destroy the cancer. - State the name of one substance humans can use and the potential cancer it is linked to. - What was the most common cancer in females in 2017.
	Achieving (keeping up): Suggest some factors that can increase the risk of cancer.	
	Excelling (going beyond): Describe treatments for cancers.	
5	Emerging (catching up): Describe the role of a doctor.	- State what the term GP stands for. - Describe the type of health condition that a psychiatrist specialises in. - Describe what the term "prescribe" means. - Mark has been over-eating for 10 years and feels very tired. Suggest what conditions Mark could have and how to reverse the effects. - Lara has been smoking cigarettes everyday for 15 years and is short of breath. Suggest what organ could be affected and how to reverse the effects
	Achieving (keeping up): Suggest some different types of doctors.	
	Excelling (going beyond): Play the role of a doctor.	
6	Emerging (catching up): Describe the effects of three health conditions.	
	Achieving (keeping up): Explain how you can get these health conditions.	
	Excelling (going beyond): Suggest ways to prevent yourself from getting these health conditions.	

Y8 Biology: Infections and Diseases

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
6	Emerging (catching up): To understand 3 ways diseases are transmitted	1) State three ways pathogens infect plants and animals 2) Explain how "Catch it, bin it, kill" adverts help reduce the spread of diseases 3) Name the best treatment for a cold? 4) Describe and explain other ways the government aims to control the spread of disease
	Achieving (keeping up): Outline methods to prevent spread of disease	
	Excelling (going beyond): Conduct an experiment to model how diseases are spread	
7	Emerging (catching up): Describe what a vaccine is made up of and how they are administered	1) State two side potential side effects of vaccines. 2) Describe what the vaccine stimulates the production of in the body and how long they remain in the blood. 3) Explain why it is important to develop vaccines. 4) State the name of two diseases that are often vaccinated against in childhood.
	Achieving (keeping up): Describe the function of vaccinations in our body.	
	Excelling (going beyond): Describe the basic history of vaccinations. Including the scientific experiments completed.	
8	Emerging (catching up): Identify fungal and protist infections	1) What causes malaria? 2) How can we get a malaria infection? 3) What symptoms does Athlete's foot cause? 4) What is a fungi?
	Achieving (keeping up): Describe how fungal and protist disease make us ill	
	Excelling (going beyond): Explain how fungal and protist infections make us ill	
9	Emerging (catching up): Diagnose some conditions based on symptoms.	1) Define a vector and name a vector that carries the malaria protist 2) Explain why its best to have a phone appointment rather than going to a GP or hospital directly (if the illness isn't severe). 3) State and explain the common difference between treating viruses and treating bacteria 4) Explain the difference between treatment and prevention. Suggest which you think is more important? 5) Doctors may have a patient with symptoms that could be caused by many diseases. Suggest how doctors overcome this.
	Achieving (keeping up): Link conditions to symptoms and the type of pathogen that causes it.	
	Excelling (going beyond): Link conditions to symptoms and the type of pathogen that causes it with prevention methods.	

Y8 Biology: Infections and Diseases

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): Identify the four different pathogens.	1) What is the definition of a pathogen? 2) List four types of pathogens 3) Give the main features of a bacteria 4) Give the main features of a virus 5) Give an example of fungal disease
	Achieving (keeping up): Describe how pathogens damage my body	
	Excelling (going beyond): Describe the pathogens and their characteristic	
2	Emerging (catching up): Identify main bacterial diseases	1) Which organ system is affected by pneumonia? 2) Suggest how salmonella can spread from a chicken to a person 3) How can you avoid catching Salmonella? 4) How do you treat bacterial infections?
	Achieving (keeping up): Describe how bacterial diseases works	
	Excelling (going beyond): Explain how bacterial diseases make us ill	
3	Emerging (catching up): Identify fungal and protist infections	1) What causes malaria? 2) How can we get a malaria infection? 3) What symptoms does Athlete's foot cause? 4) What is a fungi?
	Achieving (keeping up): Describe how fungal and protist disease make us ill	
	Excelling (going beyond): Explain how fungal and protist infections make us ill	
4	Emerging (catching up): State the job of white blood cells	1) Define immunity 2) Name the part of the blood that fights infection 3) What is a toxin? 4) Explain the difference between antitoxins and antibodies 5) Describe the stages phagocytosis
	Achieving (keeping up): State 3 ways white blood cells fight infection	
	Excelling (going beyond): Describe process of phagocytosis	
5	Emerging (catching up): Define antibiotics	1) Name two painkillers 2) State the definition of antibiotics 3) Name the best treatment for a cold. 4) What do bacteria cells have that not all cells have?
	Achieving (keeping up): Explain the difference between antibiotics and painkillers	
	Excelling (going beyond): Explain why we use antibiotics to treat bacterial diseases but not viral diseases	

Y8 Biology: **Where do I come from?**

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): State the parts of reproductive system	1) State the function of the testes 2) State the function of the ovaries 3) Describe the function of the urethra in males 4) What are gametes? Name the male and female ones 5) Describe and explain the importance of the fertilised egg
	Achieving (keeping up): Describe the function of structures the male and female reproductive systems	
	Excelling (going beyond): Describe the role of gametes in the reproduction of humans	
2	Emerging (catching up): Describe the role of sexual intercourse	1) Describe the term implantation 2) Describe the term fertilisation 3) State one reason why males may have low fertility 4) State two reasons why females may have low fertility
	Achieving (keeping up): Describe implantation and fertilisation	
	Excelling (going beyond): Explain how the fertility issues arise in males and females	
3	Emerging (catching up): State the time of gestation in humans	1) State how long gestation lasts in a human 2) State the two functions of the placenta 3) State the function of the amniotic fluid 4) Explain the difference between an embryo, foetus and a baby 5) Briefly outline the development of a foetus
	Achieving (keeping up): Describe structures needed for growth of a foetus	
	Excelling (going beyond): Explain the stages of foetal development	
4	Emerging (catching up): Describe how organisms vary	1) Classify the following into the different categories of variation 2) State the definition of a species 3) Explain why your height is both an inherited and environmental characteristic
	Achieving (keeping up): Explain the causes and types of variation	
	Excelling (going beyond): Classify characteristics	

Y8 Biology: **Where do I come from?**

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): • Describe the structure of DNA	1) State the definition of DNA 2) Describe the structure of DNA – use the words/phrases – strand, base pair, double helix 3) Draw a labelled diagram of the structure of DNA 4) State the definition of a gene 5) State how many chromosome pairs there are in the standard human body cell
	Achieving (keeping up): • State the levels of organisation for DNA in the cell	
	Excelling (going beyond): • Design a model for DNA	
6	Emerging (catching up): • Describe how sex is determined	1) State the sex chromosomes for a male and female 2) State the definition of a phenotype 3) State the definition of a mutation 4) State one symptom of cystic fibrosis 5) Draw a punnet square showing how sex (gender) is inherited
	Achieving (keeping up): • Produce a punnet square to determine biological gender	
	Excelling (going beyond): • Identify and describe some inherited diseases due to mutations	
7	Emerging (catching up): • State the importance of Charles Darwin	1) State the definition of a species 2) State the name of Charles Darwin's theory 3) State the definition of a population 4) State the definition of evolution 5) Use 4 bullet points to describe how the genes for a longer neck in giraffes is passed on
	Achieving (keeping up): • Describe the term evolution	
	Excelling (going beyond): • Explain the key stages of natural selection	
8	Emerging (catching up): • State the importance of biodiversity and identify biodiverse areas	1) Explain the term deforestation and suggest how this impacts biodiversity. 2) Explain the term extinct. 3) State three ways a species can become extinct. 4) State the name of two species that are extinct. 5) Explain how variation can lead to a reduce chance of a species becoming extinct.
	Achieving (keeping up): • Suggest how humans negatively impact biodiversity	
	Excelling (going beyond): • Describe extinction and suggest how organisms become extinct	

Y8 Biology: Interdependence

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): Identify different habitats and the organisms that live there	1) Describe the difference between a population and a community 2) State 3 examples of non-living parts of an ecosystem 3) Give 2 examples of interdependence shown between different animal species 4) Give 1 example of interdependence shown between an animal and a plant
	Achieving (keeping up): Describe how ecosystems are organised	
	Excelling (going forward): Explain how interdependence exists in a variety of ecosystems	
2	Emerging (catching up): State what food chains and food webs are	1) Describe the roles of a producer in a food chain 2) State one similarity between primary and secondary consumers 3) State two differences between primary and secondary consumers 4) Explain whether a scientist should choose to record data as a food chain or a food web
	Achieving (keeping up): Describe the levels of food chains and food webs Construct food webs from food chains and	
	Excelling (going forward): explain why food webs are more representative of ecosystems	
3	Emerging (catching up): State factors that affect the population of a species	1) Give three ways that the population of a species can be dramatically decreased 2) Explain the effect on the prey population if all the predators catch a new disease 3) Describe the effect on the predator population if the rate of breeding in prey increases 4) Describe bioaccumulation has a greater impact on secondary consumers than primary consumers
	Achieving (keeping up): Describe the effect that changing population will have on another species	
	Excelling (going forward): Explain how climate change and bioaccumulation effect populations	
4	Emerging (catching up): List some resources that animals and plants compete for in an ecosystem	1) State 3 resource that animals compete with other animals for 2) State 3 resources that plants compete with other plants for 3) Two lions are competing for a mate. Explain the type of competition that is happening 4) Explain how a decrease in the number of prey affects the population of predators
	Achieving (keeping up): Describe when organisms are more likely to outcompete a competitor	
	Excelling (going forward): Explain the relationships between predators and prey	

Y8 Biology: Interdependence

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): Recall what is meant by the term adaptations.	1) Define adaptations 2) State 3 examples of structural adaptations 3) State 2 examples of behavioural adaptations 4) Choose an animal and list all of the structure and behavioural adaptations it has
	Achieving (keeping up): Identify the adaptations of predators and prey from images.	
	Excelling (going forward): Separate adaptations into structural and behavioural.	
6	Emerging (catching up): Recall that plants produce glucose by photosynthesis	1) Write the word equation for photosynthesis 2) Describe how plants obtain the water needed for photosynthesis 3) Describe how the stem is adapted to transport water 4) Describe how leaves obtain the carbon dioxide needed to carry out photosynthesis 5) Describe the role of the phloem
	Achieving (keeping up): Identify and recall the word equation for photosynthesis.	
	Excelling (going forward): Describe how plants obtain the raw materials needed to carry out photosynthesis and where this takes place.	
7	Emerging (catching up): Describe the structure and function of the main components of a leaf.	1) Describe the structure and function of the palisade layer of a leaf 2) Describe the structure and function of the spongy layer of a leaf 3) Describe how to use a light microscope to observe leaf tissue 4) Describe the function of the stomata and guard cells
	Achieving (keeping up): Find leaf structures from under a light microscope.	
	Excelling (going forward): Describe how leaves are adapted to maximise photosynthesis.	
8	Emerging (catching up) State and identify the parts of the flower.	1) Label the key features of a flower 2) Describe the differences in the two types of pollination 3) Describe the typical structure of insect pollinated plants 4) Describe the typical structure of wind pollinated plants
	Achieving (keeping up): Describe the process of pollination.	
	Excelling (going forward): Explain how interdependence is important in plan populations.	

How is your progress measured in class in Science in **Spring** Term?

Spring 1: Becoming a Chemist

Multiple Choice Quiz	Knowledge recall on topic (15 marks): • How do you know a chemical reaction is occurring? • How do metals and non metals react? • How is energy released transferred in a chemical reaction? • How are chemical bonds represented?
In class assessment (recall, application, how Science works)	• Introduction to reactions • Acid and alkali • Chemical energy in reactions • Types of reactions

Emerging	Achieving	Excelling
Introduction to Reactions • I can describe a chemical reaction and spot simple signs. • I can name metals and non-metals and give simple differences. • I can follow a method safely and record simple results. • I can write a simple word equation and draw a basic table. Acid and Alkali • I can say what acids and alkalis are and use pH to identify them. • I can state the products of reactions with acids (metals, bases, alkalis). • I can describe neutralisation and name simple salts. • I can say what a chemical bond is.	Introduction to Reactions • I can explain how I know a reaction has happened. • I can describe metals and non-metals and predict simple reactions. • I can plan and carry out a fair test and record accurate data. • I can write word equations and present results in tables and bar graphs. Acid and Alkali • I can use indicators and pH to test acids and alkalis. • I can describe neutralisation and explain pH changes. • I can name products of acid reactions and give uses of salts. • I can model simple bonds and describe energy changes in reactions.	Introduction to Reactions • I can explain reactions clearly using scientific ideas. • I can predict and explain reactions, including displacement. • I can design and improve investigations and analyse results. • I can apply my knowledge to new questions and write correct equations. Acid and Alkali • I can explain acids, alkalis, and pH including strong and weak acids. • I can explain neutralisation and apply it to real-life uses. • I can define bond energy and explain exothermic and endothermic reactions. • I can use bond ideas to explain energy changes in chemical reactions.

How is your progress measured in class in Science in **Spring** Term (catch up)?

Spring 1: Becoming a Chemist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	- A fifty minute summative assessment worth 40 marks. 10 marks of spelling 10 MCQ questions from the quiz 14 marks of level 1 and 2 questions 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Introduction to Reactions - I can state observations from chemical reactions. - I can name some metals and non-metals and give simple differences. - I can follow a method safely - I can write a simple word equation Acid and Alkali - I can use pH to identify acids and alkalis - I can state the products of reactions with acids limited to metals - I can describe neutralisation	Introduction to Reactions - I can describe a chemical reaction and spot simple signs. - I can name metals and non-metals and give simple differences. - I can follow a method safely and record simple results. - I can write a simple word equation and draw a basic table. Acid and Alkali - I can say what acids and alkalis are and use pH to identify them. - I can state the products of reactions with acids (metals, bases, alkalis). - I can describe neutralisation and name simple salts.	Introduction to Reactions - I can explain how I know a reaction has happened. - I can describe metals and non-metals and predict simple reactions. - I can plan and carry out a fair test and record accurate data. - I can write word equations and present results in tables and bar graphs. Acid and Alkali - I can use indicators and pH to test acids and alkalis. - I can describe neutralisation and explain pH changes. - I can name products of acid reactions and give uses of salts.

How is your progress measured in class in Science in **Spring** Term?

Spring 2: Becoming a Chemist

Multiple Choice Quiz	Knowledge recall on topic (15 marks): • How do you know a chemical reaction is occurring? • How do metals and non metals react? • How is energy released transferred in a chemical reaction? • How are chemical bonds represented?
In class assessment (recall, application, how Science works)	• Introduction to reactions • Acid and alkali • Chemical energy in reactions • Types of reactions

Emerging	Achieving	Excelling
Chemical Energy in Reactions • I can state what exothermic and endothermic reactions are. • I can name basic lab equipment and use it safely. • I can follow a method and record results in a table. • I can say what a chemical bond and bond energy are. Types of Reactions • I can state what conservation of mass, combustion, and fuels are. • I can write simple word equations for reactions. • I can follow a practical safely and record results. • I can state what a physical change is and give examples.	Chemical Energy in Reactions • I can describe differences between exothermic and endothermic reactions and their graphs. • I can write a simple method and identify variables. • I can collect data and present it using graphs. • I can model simple bonds and describe energy changes in reactions. Types of Reactions • I can use word equations to explain conservation of mass. • I can describe combustion and thermal decomposition reactions. • I can plan an investigation and record results in tables and graphs. • I can describe changes of state and balance simple equations.	Chemical Energy in Reactions • I can explain energy changes using reaction profiles. • I can design a fair investigation and describe variables clearly. • I can analyse and interpret results using graphs. • I can use bond energy to explain exothermic and endothermic reactions. Types of Reactions • I can explain conservation of mass using reactions and practicals. • I can analyse combustion and thermal decomposition using equations. • I can design, carry out, and analyse fuel investigations. • I can balance more complex equations and apply my knowledge to exam questions.

How is your progress measured in class in Science in **Spring** Term (catch up)?

Spring 2: Becoming a Chemist

Multiple Choice Quiz

A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections

Section 1: ten multiple choice questions (MCQ's)

Section 2: Five written retrieval questions from the lessons

In class assessment (recall, application, how Science works)

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning

Emerging

Achieving

Chemical Energy in Reactions

- I can identify some exothermic and endothermic reactions
- I can name basic lab equipment
- I can follow a method
- I can describe the term chemical bond

Types of Reactions

- I can recall conservation of mass
- I can identify products and reactants in a word equation
- I can follow a practical safely
- I can state what a physical change is

Chemical Energy in Reactions

- I can state what exothermic and endothermic reactions are.
- I can name basic lab equipment and use it safely.
- I can follow a method and record results in a table.
- I can say what a chemical bond and bond energy are.

Types of Reactions

- I can state what conservation of mass, combustion, and fuels are.
- I can write simple word equations for reactions.
- I can follow a practical safely and record results.
- I can state what a physical change is and give examples.

Chemical Energy in Reactions

- I can describe differences between exothermic and endothermic reactions and their graphs.
- I can write a simple method and identify variables.
- I can collect data and present it using graphs.
- I can model simple bonds and describe energy changes in reactions.

Types of Reactions

- I can use word equations to explain conservation of mass.
- I can describe combustion and thermal decomposition reactions.
- I can plan an investigation and record results in tables and graphs.
- I can describe changes of state and balance simple equations

How is your progress measured in class in Science in **Spring** Term?

Spring 2: Becoming a Chemist

In class assessment (recall, application, how Science works)

40 mark assessment on Earths structure, climate and resources

Emerging	Achieving	Excelling
Earths climate and resources - I can state the composition of the atmosphere and simple functions - I can state the definition of climate change - I can state the processes in the carbon cycle - I can state the importance of metals and recycling	Earths climate and resources - I can describe more complex functions of the atmosphere - I can describe some effects of climate change - I can describe the processes in the carbon cycle - I can describe different ways to extract metals	Earths climate and resources - I can describe the greenhouse effect and how the atmosphere plays its role in this process - I can suggest further effects of climate change - I can explain how the carbon cycle links to the atmosphere - I can explain how to extract metals from ores

How is your progress measured in class in Science in **Spring** Term (catch up)?

Spring 2: Becoming a Chemist

In class assessment (recall, application, how Science works)

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Earths climate and resources • I can state the composition of the atmosphere • I can state describe the Uk climate • I can state some of the processes in the carbon cycle • I can describe the term recycling	Earths climate and resources • I can state the composition of the atmosphere and simple functions • I can state the definition of climate change • I can state the processes in the carbon cycle • I can state the importance of metals and recycling	Earths climate and resources • I can describe more complex functions of the atmosphere • I can describe some effects of climate change • I can describe the processes in the carbon cycle • I can describe different wats to extract metals

Y8 Chemistry: Introduction to Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): • Describe a chemical reaction.	- State two observations when copper carbonate is heated up. - State two observations when magnesium is added to hydrochloric acid. - State two chemical reactions that take place in living organisms.
	Achieving (keeping up): • Observe a chemical reaction.	
	Excelling (going beyond): • Describe how we know a chemical reaction is taking place.	
2	Emerging (catching up): • Describe simple observations of a chemical reaction.	- State the word equation for Lithium reacting with water. Forming Lithium hydroxide and Hydrogen. Label the reactants and the products. - State the word equation for Iron reacting with chlorine. Forming Iron chloride. Label the reactants and the products. - State the word equation for Nickel reacting with chlorine. Predict the name of the product Use the above equation to help you. Label the reactants and the product. - State two observations when Sodium is added to water.
	Achieving (keeping up): • Construct a word equation for the reaction.	
	Excelling (going beyond): • Construct more complex word equations.	
3	Emerging (catching up): • State the definition of variables in a practical.	- State the definition of the independent variable. - State the definition of the dependent variable. - State the definition of the control variables. - State what we use to measure temperature and the units we measure it in. - State the definition of volume and the units we measure it in.
	Achieving (keeping up): • Design a plan to investigate the reactivity of different metals.	
	Excelling (going beyond): • Design a results table to record your data.	
4	Emerging (catching up): • Carry practical work safely.	- Describe how you came up with the order of reactivity of the metals. - Describe how you calculated the temperature change. - Suggest how you could have improved the results of the practical.
	Achieving (keeping up): • Record the start and final temperature.	
	Excelling (going beyond): • Calculate the temperature change.	

Y8 Chemistry: Introduction to Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): Design a bar graph for my results	- State the definition of discrete data. - State the definition of continuous data. - Would discrete data be represented on a line or a bar graph. - Is blood type an example of discrete or continuous data, explain your answer.
	Achieving (keeping up): Describe the trend of the graph	
	Excelling (going beyond): Apply knowledge to exam questions based on the 3 lesson sequence	
6	Emerging (catching up): State the definition of metals and non metals.	- What is the definition of properties in Science? - State three properties of a metal. - State three properties of a non metal. - Are metals good conductor of electricity? - Are non metals magnetic?
	Achieving (keeping up): Describe differences between the metals and non metals.	
	Excelling (going beyond): Explain the differences between metals and non metals.	
7	Emerging (catching up): Observe and predict the outcomes of the demo	- Describe how the reaction with magnesium is a combustion reaction? - Why is food turning brown a oxidation reaction? - Write the reaction for rusting. - Write down the products for copper reacting with oxygen, can you identify the reactants and products.
	Achieving (keeping up): Be able to write a word equation for the practical.	
	Excelling (going beyond): Predict the outcomes for metals that react with oxygen	
8	Emerging (catching up): Define displacement	- What is meant by the term 'displacement reaction'? - What is a compound? - Which is the most reactive metal shown in this reactivity series? - Which is the least reactive metal shown in this reactivity series? - What will be produced if magnesium metal is added to a solution of copper sulfate?
	Achieving (keeping up): Carry out displacement reactions	
	Excelling (going beyond): Write equation for and predict reactions between metals and metal sulfates	

Y8 Chemistry: Acid and Alkali

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): What is an acid and an alkali.	- What is the pH scale, and how does it relate to acids and alkalis? - How can you test whether a substance is acidic or alkaline using universal indicator? - What are some common examples of acids and alkalis in everyday life? - Suggest what happens when an acid reacts with an alkali? - How can you use litmus paper to identify an acid or an alkali?
	Achieving (keeping up): State what we can use to distinguish acid and alkali.	
	Excelling (going beyond): Why is it important to identify an acid and alkali.	
2	Emerging (catching up): State the use of the pH scale..	- Which number has a stronger acidity on the pH scale. 1 or 6? - Which number has a stronger alkalinity on the pH scale. 10 or 12? - If a substance has a pH of 7, what is it called? - Give one example of a substance with a pH of 7. - What does the pH scale allow us to measure?
	Achieving (keeping up): Use the pH scale to identify acid and alkalis.	
	Excelling (going beyond): Identify the strength of acids or alkalis based on pH scale.	
3	Emerging (catching up): Be able to use natural materials to make your own indicator.	- What are the first 3 steps of making the red cabbage indicator? - List 4 pieces of equipment needed when using the indicator - In your own words why do you think it is useful to make indicators from natural products
	Achieving (keeping up): Make an indicator with red cabbage safely	
	Excelling (going beyond): Use observation to determine if common substances are acid or alkali	
4	Emerging (catching up): To identify weak vs strong acids.	- What is the difference between a strong acid and a weak acid? - How can you tell if an acid is strong or weak based on its pH? - Why are strong acids more dangerous than weak acids? - Is strength and concentration the same thing?
	Achieving (keeping up): Carry out a practical to identify weak vs strong acids.	
	Excelling (going beyond): To understand what makes an acid weak and strong.	

Y8 Chemistry: Acid and Alkali

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): State the products of an acid – alkali reaction	- Give an example of a acid, base and alkali - State one difference and similarity between a base and an alkali - Define neutralisation? - State the products from an acid – base reaction. - Describe two situations in which neutralisation reactions are useful?
	Achieving (keeping up): Describe the uses of neutralisation reactions	
	Excelling (going beyond): Perform a neutralisation reaction and explain pH changes	
6	Emerging (catching up): Describe what a salt is and give examples of uses.	- Name three different acids - Name the salts each acid above produces - Define a salt? - State three different uses of acids. - Write the two general equations between an acid and metal, acid and a base?
	Achieving (keeping up): State and name the products when acids react with bases	
	Excelling (going beyond): State and name the products when acids react with metals.	
7	Emerging (catching up): State the definition of a simple bond.	- What is a simple bond? - What is bond energy? - What is energy in a chemical reaction used for? - Is bond breaking endothermic or exothermic? - How does the number of bonds effect the melting point of a molecule?
	Achieving (keeping up): Model simple chemical bonds determine if the bonds are strong or weak	
	Excelling (going beyond): Model complex molecules and determine how this effect the energy in a bond	
8	Emerging (catching up): State the definition of bond energy.	- What do we call the strong forces that hold molecules together? - What is bond energy? - State whether bond making is endothermic or exothermic ? - Does bond breaking release energy or take energy in? - Why do cars use catalytic converters?
	Achieving (keeping up): Describe what happens to chemical bonds during exothermic and endothermic reactions.	
	Excelling (going beyond): Use your ideas about bond energies to explain energy changes in chemical reactions.	

Y8 Chemistry: Chemical Energy in Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): State the definition of exothermic and endothermic reaction	- Write the definition of endothermic reaction. - Write the definition of exothermic reaction. - Is injury pack an example of endo or exothermic reaction? Why? - Is hand warmer an example of exo or endothermic reaction? Why? - Is burning endothermic or exothermic?
	Achieving (keeping up): Describe differences between exothermic and endothermic reaction	
	Excelling (going beyond): Explain the differences between exothermic and endothermic reaction	
2	Emerging (catching up): State the definition of exothermic and endothermic.	- An exothermic reaction the final temperature increases or decreases? - In an endothermic reaction the final temperature increases or decreases? - The temperature change in an endothermic reaction is positive or negative? - The temperature change in an endothermic reaction is positive or negative? - What is the equation to calculate the temperature change?
	Achieving (keeping up): Describe differences between exothermic and endothermic.	
	Excelling (going beyond): Explain the differences between exothermic and endothermic.	
3	Emerging (catching up): State the definition neutralisation reaction	- What does the word apparatus mean? - What do we use to measure mass? - What should a good method include? - What is the dependent variable? - When an acid and alkali react, what is the name of the reaction?
	Achieving (keeping up): Determine the uses of scientific apparatus	
	Excelling (going beyond): Practice writing a scientific method	
4	Emerging (catching up): Define the 3 types of variables	- In our investigation what was the dependent variable (the variable we were measuring)? - In our investigation what was the independent variable (the variable we were changing)? - What were the control variables (variables we must keep the same)? - What should a results table include? - Which had the higher temperature change?
	Achieving (keeping up): Describe the variables in this investigation	
	Excelling (going beyond): Carry out the practical, collecting data in a result table	

Y8 Chemistry: Chemical Energy in Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): • State different types of graphs	- In our investigation were these reactions endothermic or exothermic? Explain your answer. - Which acid had the greatest temperature change? - Which reaction had the greatest transfer of energy? - What 5 things are needed to draw a perfect graph? - Which variables go on the x and y axes in a line graph?
	Achieving (keeping up): Construct different types of graphs	
	Excelling (going beyond): Interpret results by looking at graph	
6	Emerging (catching up): State the definition of reaction profile.	- What is a reaction profile graph? - In a reaction profile graph for endothermic reaction who has more energy reactants or products? Why? - In a reaction profile graph for exothermic reaction who has more energy reactants or products? Why? - What is the x axes and y axes label for a reaction profile graph? - What is activation energy?
	Achieving (keeping up): Describe differences between exothermic and endothermic reaction profile.	
	Excelling (going beyond): Explain the differences between exothermic and endothermic reaction profile.	
7	Emerging (catching up): • State the definition of a simple bond.	- What is a simple bond? - What is bond energy? - What is energy in a chemical reaction used for? - Is bond breaking endothermic or exothermic? - How does the number of bonds effect the melting point of a molecule?
	Achieving (keeping up): Model simple chemical bonds determine if the bonds are strong or weak	
	Excelling (going beyond): Model complex molecules and determine how this effect the energy in a bond	
8	Emerging (catching up): • State the definition of bond energy.	- What do we call the strong forces that hold molecules together? - What is bond energy? - State whether bond making is endothermic or exothermic ? - Does bond breaking release energy or take energy in? - Why do cars use catalytic converters?
	Achieving (keeping up): Describe what happens to chemical bonds during exothermic and endothermic reactions.	
	Excelling (going beyond): Use your ideas about bond energies to explain energy changes in chemical reactions.	

Y8 Chemistry: Types of Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): State the definition of conserved.	- State the word equation for magnesium reacting with oxygen. - If 5g of Magnesium reacts with 12g of Oxygen, what is the mass of product produced. - Write a word equation for the following. 6g of Sodium reacts with 9g of hydrochloric acid. This forms 10g of sodium chloride and some Hydrogen. Include the mass of Hydrogen produced. - If 6g of sodium reacts with chlorine and produces 20g of product, calculate the mass of chlorine that reacts.
	Achieving (keeping up): Use word equations to explain conservation of mass.	
	Excelling (going beyond): Use vinegar and baking powder to demonstrate conservation of mass.	
2	Emerging (catching up): State the definition of combustion.	- State the general combustion word equation. - State the two things that you observe during a combustion reaction. - State if a combustion reaction is exothermic or endothermic, justify your decision. - State three examples of non-renewable fuels. - State the chemical formula for carbon dioxide, water and oxygen.
	Achieving (keeping up): Write word equations for combustion reactions.	
	Excelling (going beyond): Describe what takes place during a combustion reaction.	
3	Emerging (catching up): State the definition of fuels.	- What happens during combustion reaction? - Why is it important to only change one independent variable at a time in an experiment? - Does all the heat produced by combustion go into raising the temperature of the water? - What is the main reason for repeating an experiment several times? - What role do control variables play in an experiment comparing the energy transferred by burning different fuels
	Achieving (keeping up): Design a plan to investigate The fuel that releases the most energy.	
	Excelling (going beyond): Design a results table to record your data.	

Y8 Chemistry: Types of Reactions

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	Emerging (catching up): • Investigating burning fuels practical.	- What is a fuel? - What is the main reason for repeating an experiment several times? - What is a sign that a chemical reaction is exothermic?
	Achieving (keeping up): Record the start and final temperature.	
	Excelling (going beyond): Calculate the temperature change.	
5	Emerging (catching up): • Design a bar graph for my results	- What is combustion? - Describe Complete combustion - Describe Incomplete combustion
	Achieving (keeping up): Analyse my graph to give a conclusion	
	Excelling (going beyond): • Apply knowledge to exam questions based on the 3 lesson sequence	
6	Emerging (catching up): • Describe the term thermal decomposition.	- State the word equation for the thermal decomposition of magnesium carbonate. - State the symbol equation for the thermal decomposition of magnesium carbonate. - State the word equation for the thermal decomposition of beryllium carbonate. - State the symbol equation for the thermal decomposition of beryllium carbonate. - State the name of the chemical used to test for carbon dioxide and the positive result if carbon dioxide is present.
	Achieving (keeping up): Analyse thermal decomposition reactions.	
	Excelling (going beyond): Construct word and symbol equations for thermal decomposition reactions.	
7	Emerging (catching up): • State the definition of a physical change	- What is the name of the state of matter with the strongest forces between the particles. - Describe how to change a solid into a liquid. - Describe what happens to the forces as you change state from a liquid to a gas. - State the temperature at which the stearic acid turned into a solid. - Draw a diagram showing the particles in a solid, liquid and gas.
	Achieving (keeping up): Describe physical changes of state.	
	Excelling (going beyond): Use a model to explain physical changes of state.	
8	Emerging (catching up): • State the law of conservation of mass	- State the law of conservation of mass. - What are the reactants and products in a reaction. - Explain observations about mass in a chemical reaction.
	Achieving (keeping up): Balance simple equations.	

Year 8 Chemistry: **Earth's Structure**

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Name the three rock layers of the Earth Compare the layers of the Earth Identify what is present in the Earth's crust	1) State the names of the two main elements found in the Earth's core 2) Estimate the temperature of the Earth's core 3) Draw a simple labelled diagram of Earth's structure 4) State the most common element in the Earth's crust
2	Describe how sedimentary rocks are formed Describe how igneous rocks are formed Describe how metamorphic rocks are formed	1) State two examples where sedimentary rocks are used in famous buildings 2) Describe the process of weathering in forming sedimentary rocks 3) Describe how magma forms granite 4) Describe how marble is formed from limestone 5) Explain why slate is useful in roofing tiles
3	List processes that change rocks Label a diagram explaining the rock cycle Describe properties of ceramics	1) Describe one way rocks change over time 2) State what is meant by uplift 3) State what a ceramic material is made up of 4) List two physical properties of ceramics 5) List three uses of ceramics
4	Label the layers of the Earth Design a simple model of the Earth Label the simple model of the Earth's layers	1) Identify the composition of the core and the mantle 2) Use three colours of playdoh to model the three layers of Earth

Year 8 Chemistry: **Earth's Resources**

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Describe the function of the atmosphere State the different gases that make up the atmosphere Describe the terms global warming and climate change	1) State one function of the Earth's atmosphere 2) State the percentage of Nitrogen and oxygen in the atmosphere 3) Describe what has happened to Earth's average temperature since the 18th century 4) State two potential consequences of climate change 5) Suggest why scientific papers provide more accurate facts than newspapers
2	State the names of the greenhouse gases. Briefly describe the greenhouse effect. Describe how the greenhouse gases are linked to global warming.	1) State the name and formulae of the two main greenhouse gases 2) Describe how greenhouse gases cause the greenhouse effect 3) State two examples of processes that are leading to increased methane levels in the atmosphere 4) State name of the fossil fuel that powered the industrial revolution 5) State the word equation for the combustion of coal
3	State some potential consequences of climate change Suggest ways to limit the effects of climate change Analyse data to suggest factors that cause impacts of global warming	1) Describe a consequence of ice caps melting 2) Explain why switching to renewable energy could slow down global warming 3) Explain why switching to hybrid engine cars should slow down global warming 4) Describe the relationship between average Earth temperature and carbon dioxide concentration of the atmosphere
4	Label simple parts of the carbon cycle Describe some key processes in the carbon cycle Analyse the carbon cycle and understand the relevance of metabolic reactions	1) State the word equation for photosynthesis 2) Explain how photosynthesis changes the amount of carbon dioxide in the atmosphere 3) State the word equation for respiration 4) Explain how respiration changes the amount of carbon dioxide in the atmosphere 5) Describe how combustion of fossil fuels changes the amount of carbon dioxide in the atmosphere

Year 8 Chemistry: **Earth's Resources**

Spring Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Describe the importance of metals and state the definition of an ore State word equations for the extraction by carbon Describe how to extract metals above carbon in the reactivity series	1) State the definition of the native state 2) State the word equation for iron being extracted from iron oxide by carbon 3) Explain the term electrolysis 4) Explain why sodium cannot be extracted from sodium oxide using carbon
6	State the definition of a finite resource Explain the importance of recycling Analyse specific uses of recycling	1) State, with an example, the definition of a finite resource 2) Describe what landfill is 3) State two advantages of recycling 4) State two disadvantages of using landfill sites

How is your progress measured in class in Science in **Summer** Term 1?

Summer: Becoming a Physicist

Multiple Choice Quiz

A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each.

Section 1: Five multiple choice questions (MCQ's)

Section 2: Five written retrieval questions

Section 3: One extended written response

In class assessment (recall, application, how Science works)

- A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Sound -I can give some examples of longitudinal waves. -I can say that pitch and frequency are related. -I can say what ultrasound is. Light -I can differentiate a transverse wave from a longitudinal wave by looking to an image of these waves. -I can tell when reflection of light takes place. -I can name the parts of an eye.	Sound -I can give the definition of a longitudinal wave. -I can say that the higher the pitch, the higher is the frequency (and vice-versa). -I can say what ultrasound is and tell the auditory range. Light -I can give the definition of a transversal wave. -I can name the difference between reflection and refraction of light. -I can name the parts and functions of an eye.	Sound -I can label the parts of a longitudinal wave. -I can say that the higher the frequency the smaller the wavelength (and vice-versa). -I can say what animals can hear ultrasound and why . Light -I can label the angles of incidence, reflection, and refraction. -I can say why refraction of light does not take place in a normal incidence. -I can say what short sight and long sight vision is.

How is your progress measured in class in Science in **Summer** Term 1 (catch up?)

Summer: Becoming a Physicist

Multiple Choice Quiz

A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections

Section 1: ten multiple choice questions (MCQ's)

Section 2: Five written retrieval questions from the lessons

In class assessment (recall, application, how Science works)

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Sound -I can describe water as wave -I can say that recall the terms pitch and frequency -I can say what ultrasound is. Light -I can differentiate describe what a transverse and longitudinal wave are -I can tell use a mirror ro describe reflection -I can label some parts of the eye	Sound -I can give some examples of longitudinal waves. -I can say that pitch and frequency are related. -I can say what ultrasound is. Light -I can differentiate a transverse wave from a longitudinal wave by looking to an image of these waves. -I can tell when reflection of light takes place. -I can name the parts of an eye.	Sound -I can give the definition of a longitudinal wave. -I can say that the higher the pitch, the higher is the frequency (and vice-versa). -I can say what ultrasound is and tell the auditory range. Light -I can give the definition of a transverse wave. -I can name the difference between reflection and refraction of light. -I can name the parts and functions of an eye.

How is your progress measured in class in Science in **Summer** Term 2?

Summer: Becoming a Physicist

Multiple Choice Quiz

A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of three sections worth 5 marks each.

Section 1: Five multiple choice questions (MCQ's)

Section 2: Five written retrieval questions

Section 3: One extended written response

In class assessment (recall, application, how Science works)

A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Contact Forces I can define what moment is. I can say the Hooke's law. Pressure I can define what atmospheric pressure is. I can define what a pressure in a liquid is.	Contact Forces I can calculate the moment of a force by applying the formula $\text{Moment} = \text{Force} \times \text{distance}$. I can use the Hooke's law to calculate the elastic force exerted by a stretched spring. Pressure I can say that atmospheric pressure decreases with altitude. I can calculate the pressure in a liquid by using the correct formula.	Contact Forces I can say the resultant momentum and the direction of spinning when more than one force is applied in a system. I can rearrange the Hooke's law to calculate the spring constant of a spring or to calculate its elongation. Pressure I can say why some airplanes need to be pressurized. I can calculate the pressure in a swimming pool by calculating the pressure from the liquid + the atmospheric pressure.

How is your progress measured in class in Science in **Summer** Term 2 (catch up)?

Summer: Becoming a Physicist

Multiple Choice Quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
In class assessment (recall, application, how Science works)	• A fifty minute summative assessment worth 40 marks. • 10 marks of spelling • 10 MCQ questions from the quiz • 14 marks of level 1 and 2 questions • 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Contact Forces I can carry out simple multiplication I can recall Hooke's law Pressure I can give examples of atmospheric pressure I can give examples of liquid pressure	Contact Forces I can define what moment is. I can say the Hooke's law. Pressure I can define what atmospheric pressure is. I can define what a pressure in a liquid is.	Contact Forces I can calculate the moment of a force by applying the formula $\text{Moment} = \text{Force} \times \text{distance}$. I can use the Hooke's law to calculate the elastic force exerted by a stretched spring. Pressure I can say that atmospheric pressure decreases with altitude. I can calculate the pressure in a liquid by using the correct formula.

How is your progress measured in class in Science in Summer Term 2?

Summer: becoming a physicist

Electricity and electromagnets topic test

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Electricity I can construct a basic circuit I can use a basic circuit to describe current I can match basic circuit components Electromagnets I can match the poles of a magnet on a diagram I can build a basic electromagnet I can give some examples of motors	Electricity I can state the definition of current and potential difference I can state the definition of resistance I can identify basic circuit components Electromagnets I can Label the poles of a magnet I can state the definition of an electromagnet I can state the definition of a DC motor	Electricity I can state the definition and draw basic series and parallel circuits I can calculate resistance I can draw circuit symbols for basic circuit components Electromagnets I can describe what happens when poles of magnets are arranged near each other I can state examples of electromagnets I can describe uses of DC motors

How is your progress measured in class in Science in Summer Term 2 (catch up)?

Summer: becoming a physicist

Electricity and electromagnets topic test

A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Electricity I can state the definition of current and potential difference I can state the definition of resistance I can identify basic circuit components Electromagnets I can Label the poles of a magnet I can state the definition of an electromagnet I can state the definition of a DC motor	Electricity I can state the definition and draw basic series and parallel circuits I can calculate resistance I can draw circuit symbols for basic circuit components Electromagnets I can describe what happens when poles of magnets are arranged near each other I can state examples of electromagnets I can describe uses of DC motors	Electricity I can state the rules for current and potential difference in series and parallel circuits I can rearrange the resistance equation to calculate current and potential difference I can construct circuits from basic circuit components Electromagnets I can explain what happens when poles of magnets are arranged near each other I can describe three factors that can increase the strength of an Electromagnet I can give a simple explanation of how a DC motor works

Y8 Physics: Sound

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	- Label key parts of a longitudinal wave. - Describe how sound travels. - Use key terms to describe sound.	1) State the definition of compression and rarefaction. 2) State the definition of wavelength. 3) State the definition of amplitude and frequency. 4) State the medium that sound travels through the quickest. 5) State the speed of sound in air.
2	- Carry out the practical. - Measure the speed of sound. - Take repeat readings.	1) To calculate the mean add up all your results and divide by how many times you repeated it. 2) Use your mean time and distance to find the speed. 3) Suggest one problem with the practical 4) How could you improve the practical results.
3	- Describe the term pitch and relate it to frequency. - Analyse the auditory range. - Analyse an oscilloscope to find frequency.	1) Sketch two diagrams, one showing a high frequency wave and one showing a low frequency wave that both have the same amplitude. 2) State the definition of infrasound and ultrasound. 3) Convert 1100Hz into kHz. 4) Describe how to change the pitch of a sound. 5) Calculate the frequency of a wave that has a time period of 0.004seconds.
4	- Explain what is meant by audible range - Understand how the ear detects sounds - Apply ideas about sound to explaining defects in hearing	1) How many Hertz are there in 1 kHz? 2) Suggest why dog whistles can be heard by dogs but not by humans. 3) Where in the ear are: Electrical signals transmitted to the brain? Vibrations first detected? 4) Who is most likely to be most at risk of having problems with poor hearing?

Y8 Physics: Sound

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	- State the definition of ultrasound - Calculate the speed of sound - Produce a poster summarising the uses of ultrasound	Calculate the following. Include units in your answer. 1) Speed of an object that has travelled 100m in 20seconds. 2) Speed of an object that has travelled 5km in 800seconds. Your answer must be in m/s. 3) Speed of an object has travelled 150m in 1 minute. Your answer must be in m/s. 4) Distance an object has travelled if it is moving at 5m/s in 200 seconds. 5) Distance an object has travelled if it is moving at 20m/s in 2 minutes.

Y8 Physics: Light

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	- Describe the properties and model of a transverse wave - Understand and explain superposition of waves - Compare and contrast the properties of sound and light waves	1) Give an example of a transverse wave 2) Describe the direction of oscillations compared to wave direction. 3) Which travel faster, sound waves or light waves? 4) What two things can happen when waves combine? 5) What can sound waves not travel through and why?
2	- Understand how light is reflected in a plane mirror - Know how and why refraction occurs - Know the difference between Specular and Diffuse Reflection	1) If you see an object in a plane mirror describe the size and shape of the image formed 2) What is the difference between specular and diffuse reflection 3) When does refraction occur? 4) What are the two types of lenses called which use refraction 5) Give an example of each type of lens
3	- Be able to state the law of reflection - Be able to carry out an investigation to prove the law of reflection - Be able to draw and use ray diagrams	1) The Law of Reflection: The angle of reflection is less than/equal to/more than the angle of incidence. 2) We can therefore predict that an angle of incidence of 62.3° will have an angle of reflection of _____. 3) What is the angle of incidence if the angle of reflection is 46° 4) What kind of mirror does the law of reflection apply to?
4	- Understand why refraction happens - Be able to complete a ray diagram in a refraction practical - Be able to measure the angle of incident and angle of refraction	1) What happens to light when it changes from one medium to another? 2) What do you call the ray of light entering the glass block in refraction practical? 3) What do you call the ray of light leaving the glass block in a refraction practical? 4) What do you call the line at 90° to the refracting material? 5) How can you measure how much the incident ray has been refracted?

Y8 Physics: Light

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	- Identify the different parts of the mammalian eye and state their function - Describe how the retina of the eye allow us to see images - Describe how to correct problems with vision	1) What part of the eye does light focus on in a clear image? 2) What cells in the eye are responsible for detecting movement? 3) Describe how the lens assists in forming images 4) What are the two types of lens, and what do these lenses do? 5) Describe what happens, in as much detail as possible, when photoreceptors are stimulated.
6	- Describe how a pinhole camera works to form images - Produce a pinhole camera of your own	1) Take the lid off the Pringles can and wipe the inside of the can. Keep the lid. 2) Draw a line with a marker pen all around the can, about 8cm up from the bottom. 3) Use scissors to carefully cut along the line so that the tube is in two pieces. 4) Make a small hoed in the metal end of the can using a pin 5) Put the plastic lid onto the shorter piece of tube. 6) Tape the pieces together, with the lid in the middle. 7) Cover the can in metal foil and tape.
7	- Describe our eye sees different colours of light - Describe how a glass prism allows us to see the colours of the light spectrum - Describe how coloured filters change the colour of light that are seen	1)What property is different about the colours in the colour spectrum? 2) Describe how a glass prism allows us to see the colour spectrum. 3) Describe how objects appear to us as orange. 4) Describe how some objects appear to us as white. 5) A student takes a green filter and a cyan filter and puts them together. Explain the colour that they will see. Use a diagram to help you if you wish.

Y8 Physics: Contact Forces

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	- When a force is applied to an object it can cause it to rotate - The rotational effect of a force is called a moment - Explain how turning forces are used in levers	1) What is the formula for calculating moments ? 2) What are the units for moments, force and distance? 3) A force of 40N is applied 0.4m from a pivot. What is this moment? 4) A moment of 15Nm is created by a force of 60N. What is the perpendicular distance of the force from the pivot ? 5) A moment of 200Ncm is created by a force acting 4cm from a pivot. What is the size of the force?
2	- I can investigate turning forces - I can calculate turning forces - I can apply the principle of moments to state if an object is in equilibrium or will rotate clockwise or anticlockwise	1) Set up the equipment. 2) Measure and record the distance between the pivot and masses. 3) Test different combinations of masses and distances on each side and identify the ones which allow the beam to be balanced.
3	- To state what is meant by deformation - To describe how forces affect the shape of objects - To state and apply Hooke's law to various scenarios.	1) Can you rearrange the equation $F = kx$; To get k on one side of the equation Now, can you rearrange it to get x on its own? 2) What Force would be needed to extend a spring with a spring constant $k=5$, 0.3 m? 3) If a 4N weight is hung on a spring, and it extends by 0.2m. what is the spring constant (k)? What do you think the units are? 4) What force is necessary to stretch an ideal spring with a spring constant of 120 N/m by 0.30 m? 5) A spring with a spring constant of 600N/m is used for a scale to weigh fish. What is the weight (force) of a fish that would stretch the spring by 0.075m from its normal length?

Y8 Physics: Contact Forces

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	- Investigating Hooke's law - Measure a range of spring extensions for a range of forces - Analyse data	1) Set up the equipment . 2) Use the ruler to measure the length of the unstretched spring and record this as the start length. 3) Attach the mass hanger to the spring. This exerts a force of 1N. 4) Measure the new length of the spring and use this length to calculate the extension. 5) Add a 100g mass to the mass hanger to increase the force by 1N. Measure and record the extension of the spring. 6) Continue to repeat step 5 until you have a force of 5N acting on the spring (the mass hanger and four masses). 7)Unload the spring and repeat twice more to calculate a mean.

Y8 Physics: Pressure

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	- Define atmospheric pressure - Understand how atmospheric pressure changes with altitude - Explain the relationship between altitude and atmospheric pressure	Gap fill definition and explanation.
2	- State what liquid pressure is. - Understand that liquid pressure increases with depth - Explain why objects float or sink	1) Pressure in liquids only happens downward. 2) Pressure in a liquid acts perpendicular (in a right angle) to a surface. 3) Pressure increases with depth in a liquid. 4) Pressure from an object in a fluid creates an upthrust force. 5) Liquids cannot be compressed because the particles are already close together.
3	- Understand that pressure is the force applied per unit area - Understand how a change in force will affect the pressure applied to the area - To be able to apply the force, pressure, area equation	1) Calculate the pressure exerted by a 1000N elephant when standing on the floor if his feet have a total area of 1m². 2) A brick is rested on a surface. The brick has an area of 20cm². Its weight is 10N. Calculate the pressure. 3) A woman exerts a pressure of 100N/cm² when standing on the floor. If her weight is 500N what is the area of the floor she is standing on?

Year 8 Physics: Electricity (ABH)

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	• Recognise and describe the function of circuit components • Draw and build functional circuits using bulbs, motors and batteries • Recognise and describe the difference between a series and parallel circuit	1. What is a conductor of electricity? 2. What is an electrical insulator? 3. What is a series circuit? 4. What is a parallel circuit? 5. Draw a circuit in the box below consisting of one cell, an ammeter, and two bulbs
2	• Describe potential difference as a push that charges gain from a cell or battery • Describe how to measure the potential difference of a series and parallel circuit • Explain how potential difference affects the way that components work	1. Define potential difference 2. What is the unit for potential difference? 3. What would you use to measure the potential difference in a circuit? 4. Draw the symbol for a voltmeter 5. How do you connect voltmeters in a circuit?
3	• Describe what is meant by current • Describe what happens to current in a series and parallel circuit • Describe how to measure the current of a component and build a circuit to illustrate this	1. What is current? 2. What piece of equipment do you use to measure current? Draw the symbol for this component 3. How do you connect an ammeter in a circuit? 4. What is the rule for current in a series circuit? 5. What is the rule for current in a parallel circuit?
4	• Describe what is meant by resistance and how increasing resistance decreases the current in a circuit • Use formula to calculate the resistance in a circuit from given information • Explain, using built circuits, how changing resistance affects the current and appearance of a bulb	1. What is resistance? 2. What is the symbol for resistance? 3. What are the units for resistance? 4. How do you calculate resistance? 5. How do you calculate the total resistance in a series circuit?

Year 8 Physics: Electricity (ABH)

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	• Set up a simple circuit to measure potential difference and current • Investigate how increasing the number of electrical components affects resistance • Analyse the relationship between current and resistance	1. Draw the symbol for a fixed resistor 2. Write down the equation that links potential difference, current and resistance. 3. What does directly proportional mean 4. Which variable do you plot on the x – axis? 5. Which variable do you plot on the y – axis?
6	• Build a functioning circuit from a circuit diagram • Draw a circuit diagram from a pre-made circuit • Fix a faulty circuit to make it match one in a circuit diagram	1. Which component provides power to the circuit? 2. Draw the electronic symbol for a cell and a battery 3. What is the difference between a cell and a battery? 4. What is the difference between a series and parallel circuit?
7	• Draw a circuit used to measure the current and potential difference of a range of circuit components • Build a circuit used to measure the current and potential difference of a range of circuit components • Build a circuit to calculate the resistance of a range of different components	1. Are ammeters connected in series or in parallel to the component? 2. Are voltmeters connected in series or in parallel to the component? 3. Identify the missing current values 4. Identify the missing current and potential difference values
8	• Describe how charged objects interact with each other • Describe what happens when charged objects are placed near each other • Describe the properties of an electric field	1. What is an electrical insulator? 2. What happens when two positive charges are placed near each other? 3. What happens when two negative charges are placed near each other? 4. what happens when one positive charge and one negative charge are placed near each other? 5. What is an electric Field?

Year 8 Physics: Electromagnets (ABH)

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
10	- Describe how magnets interact - Describe how magnetic field diagrams tell you about the direction and strength of magnetic field - Explain observations about navigation using the Earth's magnetic field	- What are the three magnetic elements? - What is a 'induced' magnet? - Two like poles will each other - Two unlike poles willeach other - Magnetic field lines always go from the pole to the pole.
11	- Describe what the difference between a magnet and electromagnet is - Describe how to make an electromagnet - Explain how to change the strength of an electromagnet	- What are magnets? - When electricity flows through a wire, it creates a - What are electromagnets? - What is a solenoid? - How can you increase the strength of an electromagnet?
12	- Build a simple electromagnet - Build electromagnets with different strengths - Explain how the strength of an electromagnet changes with distance	- Why did you include certain features? - How did you increase the magnetic field? - Why is the iron core not magnetic when the current is turned off? - How could you prove there was a magnetic field around your electromagnet?
13	- Explain why you choose an electromagnet rather than a permanent magnet for a purpose - Describe how electric bells, circuit breakers, loud speakers and DC motors work	- True or false? When current flows through a wire, it generates a magnetic field. - What is the name of the coil of wire with many turns? - True or false? Motors and loudspeakers use the same effect to work. - In an electrical motor, what will happen if the current direction is reversed? - Which part of a loudspeaker causes the air to vibrate?

Y9 Science

Becoming a physicist

Calculate the density of different solid and liquid substances

Foundations in physics – Particle model of matter

Big picture: Use the particle model to explain key properties of substances

Becoming a physicist

Evaluate the UK's power mix

Foundations in physics – Energy

Big picture: Use energy stores and transfers to describe different energy transfers

Becoming a physicist

Calculate the specific heat capacity of different materials/substances

Foundations in physics – Energy resources

Big picture: Analyse advantages and disadvantages of different energy resources

Becoming a Chemist

Use moly mods to build covalent molecules and structures

Foundations in Chemistry – Structure and Bonding

Big picture: Explore the chemical bonding of non-metal and metal atoms and explain the properties of these compounds

Becoming a Chemist

Investigate the difference in reactivity in highly reactive metals

Foundations in Chemistry – Atomic Structure

Big picture: Investigate the history of the atom and Periodic Table and explain how elements interact chemically

Becoming a Chemist

Investigate the different solubilities of solutes and analyse results quantitatively

Foundations in Chemistry – Chemical Analysis

Big picture: Explain how Chemists test mixtures and substances for purity

Foundations in Biology – Bioenergetics

Big picture: Look deeper at the structure of chloroplasts and mitochondria to explain the metabolic reactions that take place in plants and animals

Foundations in chemistry – The periodic table

Big picture: Analyse changes to the periodic table over time and look in depth at trends in group 1, 7 and 0.

Becoming a Biologist

Investigate the factors that affect a plant's ability to photosynthesise

Becoming a Biologist

Investigate how concentrations affect the movement of water through plant tissue

Becoming a Biologist

Use a light microscope to observe and draw human cheek cells

Foundations in Biology – Transport

Big picture: Explore how Biological substances move through organisms

Foundations in Biology – Cell Biology

Big picture: Advance on prior learning by looking in more detail at cells under a microscope and explaining their specialised functions

Maths for science

Learn the key mathematical skills for foundations in science

Y9 Science Catch up

Foundations in physics – Particle model of matter

Big picture: Recall the particle model and use it to describe some properties of substances

Becoming a physicist

Recall a method to calculate the density of some solids

Foundations in physics – Energy

Big picture: Recall different energy stores and their transfers

Becoming a physicist

Carry out and recall a method for the specific heat capacity practical

Becoming a physicist

Describe the UK's power mix

Foundations in physics – Energy resources

Big picture: Analyse advantages and disadvantages of different energy resources

Becoming a Chemist

Use moly mods to build covalent molecules

Foundations in Chemistry – Atomic Structure

Big picture: Recall the structure of the atom and describe an isotope

Becoming a Chemist

Investigate the difference in reactivity in reactive metals

Foundations in Chemistry – Structure and Bonding

Big picture: Describe the bonding of metals and non-metals

Becoming a Chemist

Carry out and recall a method for chromatography

Becoming a Chemist

Describe observations of group 1 reactions with water

Foundations in Chemistry – Chemical Analysis

Big picture: Identify substances as mixtures or pure

Foundations in chemistry – The periodic table

Big picture: Observe reactions of group 1 and some group 7. Recall the scientists involved in the periodic table

Becoming a Biologist

Carry out and recall a method to investigate photosynthesis

Foundations in Biology - Bioenergetics

Big picture: Recall equations for photosynthesis and respiration. Use these to describe some of the processes

Becoming a Biologist

Carry out and recall a method to investigate osmosis

Foundations in Biology – Transport

Big picture: Describe diffusion and osmosis

Becoming a Biologist

Use a light microscope to identify some organelles in an animal and plant cell

Foundations in Biology – Cell Biology

Big picture: State the functions of organelles of animal and plant cells

Maths for science

Use multiplication and division in a scientific concept

How is your progress measured in class in Science in **Autumn** Term 1?

Autumn: Foundations in biology

Earth's structure and climate/resources assessment

A fifty minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Whole school AP1

Emerging	Achieving	Excelling
Maths for science I can convert between simple units I can plot simple bar graphs from data	Maths for science I can convert between more complex units I can plot simple line graphs from data	Maths for science I can include these conversion in simple calculations I can decide which graphs to plot based from the variables present

How is your progress measured in class in Science in **Autumn** Term 1 (catch up)?

Beginning	Emerging	Achieving
Maths for science I can convert between some simple units I can annotate and improve on simple bar graphs from data	Maths for science I can convert between simple units I can plot simple bar graphs from data	Maths for science I can convert between more complex units I can plot simple line graphs from data

How is your progress measured in class in Science in **Autumn** Term 1

Autumn: Foundations in Biology

Cell biology 1a quiz	15-minute quiz to formatively assess.
Cell Biology topic test	A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Cell biology 1a I can identify and name specialised animal and plant cells. I can state the functions of an electron and light microscope I can recall the equation used to calculate magnification I can describe how chromosomes are arranged in the nucleus	Cell biology 1a I can describe the adaptations of specialised animal and plant cells; and separate cells into prokaryotic or eukaryotic cells I can describe the differences in magnification and resolution between light and electron microscopes. I can rearrange the magnification equation to calculate real or image size. I can describe the three stages of cell cycle including mitosis	Cell biology 1a I can explain how the adaptations of specialised animal and plant cells enable their functions and compare prokaryotic and eukaryotic cells. I can analyse the advantages and limitations of both light and electron microscopes. I can convert between millimetres, micrometres, and nanometres I can give examples and explain the importance of the cell cycle in supporting healthy tissues.

How is your progress measured in class in Science in **Autumn** Term 1 (catch up)?

Autumn: Foundations in Biology

Cell biology 1a quiz	A fifteen minute formative assessment to identify strengths, gaps and inform teaching. Consists of two sections Section 1: ten multiple choice questions (MCQ's) Section 2: Five written retrieval questions from the lessons
Cell Biology topic test	• A fifty minute summative assessment worth 40 marks. • 10 marks of spelling • 10 MCQ questions from the quiz • 14 marks of level 1 and 2 questions • 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Cell biology 1a I can label some animal, plant and specialised cells I can label the key parts of a light microscope I can carry out simple multiplication and division I can describe the term chromosome	Cell biology 1a I can identify and name specialised animal and plant cells. I can state the functions of an electron and light microscope I can recall the equation used to calculate magnification I can describe how chromosomes are arranged in the nucleus	Cell biology 1a I can describe the adaptations of specialised animal and plant cells; and separate cells into prokaryotic or eukaryotic cells I can describe the differences in magnification and resolution between light and electron microscopes. I can rearrange the magnification equation to calculate real or image size. I can describe the three stages of cell cycle including mitosis

How is your progress measured in class in Science in **Autumn** Term 1

Autumn: Foundations in Biology

Cell biology 1a quiz

15-minute quiz to formatively assess.

Cell Biology topic test

A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Cell biology 1b I can recall the definitions of diffusion, osmosis and active transport I can recall some factors that affect the rate of diffusion, osmosis and active transport I can recall a simple method for the osmosis practical	Cell biology 1b I can give examples of these processes in human cells I can recall most factors that affect the rate of diffusion, osmosis and active transport I can analyse some data from the osmosis practical	Cell biology 1b I can give examples of these processes in plant cells I can recall all factors that affect the rate of diffusion, osmosis and active transport I can plot a graph from data for the osmosis practical

How is your progress measured in class in Science in **Autumn** Term 1

Autumn: Foundations in Biology

Cell biology 1a quiz	15-minute quiz to formatively assess.
Cell Biology topic test	A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Beginning	Emerging	Achieving
Cell biology 1b I can recall the definitions of diffusion and osmosis II can describe how to icnrease the rate of diffusion I can carry out a simple method for the osmosis practicalI can caryr out a simple method for the osmosis practical	Cell biology 1b I can recall the definitions of diffusion, osmosis and active transport I can recall some factors that affect the rate of diffusion, osmosis and active transport I can recall a simple method for the osmosis practical	Cell biology 1b I can give examples of these processes in human cells I can recall most factors that affect the rate of diffusion, osmosis and active transport I can analyse some data from the osmosis practical

How is your progress measured in class in Science in Autumn Term 2

Spring: Foundations in Biology

Bioenergetics topic test

A fifty-minute summative assessment worth 40 marks, to evaluate understanding against curriculum objectives

Emerging	Achieving	Excelling
Bioenergetics I can recall the word equation for photosynthesis and discuss factors that affect the rate I can recall a basic method for the photosynthesis practical I can recall the word equation for aerobic and anaerobic respiration	Bioenergetics I can recall the symbol equation for photosynthesis and describe factors that affect the rate I can collect data and explain the photosynthesis practical I can recall the balanced symbol equation for aerobic respiration and describe how respiration changes when exercise is taking place	Bioenergetics I can recall the balanced symbol equation for photosynthesis and explain factors that affect the rate I can construct graphs and analyse data from the photosynthesis practical I can describe how metabolic changes take place when respiration is taking place

How is your progress measured in class in Science in Autumn Term 2 (Catch up)

Spring: Foundations in Biology

Bioenergetics topic test

- A fifty minute summative assessment worth 40 marks.
- 10 marks of spelling
- 10 MCQ questions from the quiz
- 14 marks of level 1 and 2 questions
- 6 mark extended answer scaffolded written question

Beginning	Emerging	Achieving
Bioenergetics I can recall the word equation for photosynthesis I can carry out a basic method for the photosynthesis practical I can fill in the word equation for aerobic and anaerobic respiration	Bioenergetics I can recall the word equation for photosynthesis and discuss factors that affect the rate I can recall a basic method for the photosynthesis practical I can recall the word equation for aerobic and anaerobic respiration	Bioenergetics I can recall the symbol equation for photosynthesis and describe factors that affect the rate I can collect data and explain the photosynthesis practical I can recall the balanced symbol equation for aerobic respiration and describe how respiration changes when exercise is taking place

Year 9 Numeracy: Maths for Science (MBA)

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5		
6		

Y9 Biology: Cell Biology 1a

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): I can recognise and draw animal and plant cells	- What is the function of the nucleus? - What is the function of the cell membrane? - What is the function of ribosomes? - Which 5 organelles do both plant and animal cells have? - Which 3 organelles are only present in plant cells and what are their functions?
	Achieving (keeping up): I can describe the function of organelles in plant and animal cells	
	Excelling (going forward): I can describe and differences in cell structure in plant and animal cells	
2	Emerging (catching up): I can define Prokaryotic and Eukaryotic cells	Exam question a) List the main structures you would expect to find in a human cell. b) State the three extra features that may be found in plant cells but not animal cells. c) Describe the main functions of these extra structures 2. Suggest why the nucleus and the mitochondria are so important in all cells. 3. Chloroplasts are found in many plant cells but not all of them. Suggest two types of plant cells that are unlikely to have chloroplasts and, in each case, explain why they have none.
	Achieving (keeping up): I can recognise and draw a bacterial cell	
	Excelling (going forward): I can compare the structure and size of bacterial cells to Eukaryotic cells	
3	Emerging (catching up): I can identify parts of the microscope and describe their function	- What is the function of the nucleus? - What is the function of the cell membrane? - What is the function of ribosomes? - Which 5 organelles do both plant and animal cells have? - Which 3 organelles are only present in plant cells and what are their functions?
	Achieving (keeping up): I can compare the function of a light and electron microscope	
	Excelling (going forward): I can describe how to set up and adjust a light microscope to produce clear images	

Y9 Biology: Cell Biology 1b

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): I can define diffusion	1) State the definition of diffusion 2) Give two examples where diffusion is important in living organisms 3) Explain how plants get carbon dioxide from the air into their leaves 4) Explain how temperature increases the rate of diffusion 5) Explain concentration increases the rate of diffusion
	Achieving (keeping up): I can state some molecules that diffuse in living organisms	
	Excelling (going forward): I can explain the factors that affect the rate of diffusion	
2	Emerging (catching up): I can list examples of exchange surfaces in animals	1) Describe the need for exchange surfaces in larger animals compared single-cell organisms 2) Name the structures that increase efficiency of diffusion in the lungs 3) Explain how these structures increase the surface area of the lungs 4) Name the structures that increase efficiency of diffusion in fish gills 5) Explain how fish have efficient gas exchange
	Achieving (keeping up): I can describe how animal exchange surfaces are adapted to maximise diffusion	
	Excelling (going forward): I can explain, using concentration gradients, how gas exchange occurs in mammals and fish	
3	Emerging (catching up): I can calculate surface area to volume ratios of different sized cubes	1) Describe how to calculate surface area 2) Describe how to calculate volume 3) Describe how to calculate surface area to volume ratio 4) Explain why larger animals need to have adaptations to have efficient gas exchange but single celled organisms do not. 5) Calculate the surface area to volume ratio for a cube of 11 cm
	Achieving (keeping up): I can state how the size of an organism affects its surface area to volume ratio	
	Excelling (going forward): I can explain, using surface area to volume ratios, why multicellular organisms need exchange surfaces, whereas unicellular organisms do not	
4	Emerging (catching up): Define osmosis	1) State the definition of osmosis 2) What is a partially permeable membrane 3) What is a dilute solution? 4) What is a concentrated solution? 5) Compare osmosis and diffusion
	Achieving (keeping up): Understand how osmosis affects the mass of animal and plant cell tissue	
	Excelling (going forward): Describe what happens to animal and plant cell structure when they lose or gain water	

Y9 Biology: Cell Biology 1b

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up): I can carry out an investigation to investigate the effect of glucose concentration on the mass of a potato	1) What apparatus do we use to measure the mass of the potato? 2) What apparatus do we use to measure the volume of solution? 3) Why do we cut the potato pieces to 2 cm? 4) Why do we need to dab the pieces of potato with a paper towel before weighing the mass? 5) Why do we need to calculate the change in mass?
	Achieving (keeping up): I can make predictions to the mass changes for each potato piece	
	Excelling (going forward): I can use correct apparatus to measure the mass of potato pieces	
6	Emerging (catching up): I can calculate mass changes in each sample after 24 hours	1) 1)What is the calculation for percentage change in mass? 2) Describe how you know if the potato has gained or lost mass 3) Explain the difference between accurate and precise 4) Calculate the percentage change for a potato that has a mass of 1.2 g then after 24 hours became 1.6 g. 5) Explain the change in mass of question 4
	Achieving (keeping up): I can calculate percentage changes of mass	
	Excelling (going forward): I can describe how changes in mass are due to osmosis	
7	Emerging (catching up): I can plot a line graph of glucose concentration against percentage mass change	1) What is the label for the x-axis for this practical? And the units? 2) What is the label for the y-axis for this practical? And the units? 3) Explain how to draw a line of best fit 4) Describe how to estimate the concentration of potato 5) Explain the effect of solution on the percentage change in mass
	Achieving (keeping up): I can describe and explain trends shown by the line of best fit	
	Excelling (going forward): I can use a line graph to estimate the glucose concentration of the potato and explain in relation to osmosis	
8	Emerging (catching up): I can define active transport	1) What is the label for the x-axis for this practical? And the units? 2) What is the label for the y-axis for this practical? And the units? 3) Explain how to draw a line of best fit 4) Describe how to estimate the concentration of potato 5) Explain the effect of solution on the percentage change in mass
	Achieving (keeping up): I can describe examples of molecules that are transported by active transport	
	Excelling (going forward): I can explain the role of mitochondria in active transport	

Y9 Biology: Bioenergetics L1 - L10

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up) I can recall the word and balanced symbol equations for photosynthesis	Q1) Name the organelle where Photosynthesis takes place Q2) What is Chlorophyll? Q3) Where do plants gain water from? Q4) What is the word and symbol balanced equation for photosynthesis? Q5) Define Endothermic reaction
	Achieving (keeping up): I can describe where in a plant and cell photosynthesis takes place.	
	Excelling (going forward): I can explain why photosynthesis is an example of an endothermic reaction	
2	Emerging (catching up) I can state the factors that will affect the rate of photosynthesis	• What is a limiting factor in photosynthesis? • How does light intensity affect the rate of photosynthesis? • Why is carbon dioxide a limiting factor in photosynthesis? • How does temperature affect the rate of photosynthesis? • What happens to the rate of photosynthesis when more than one factor is limiting?
	Achieving (keeping up): I can explain describe what a 'limiting factor' is	
	Excelling (going forward): I can identify limiting factors from line graphs	
3	Emerging (catching up) I can describe the optimal conditions for the rate of photosynthesis	• Which of the limiting factors can be changed by farmers? • Which of the four limiting factors are farmers not able to control? • Why are farmers not able to control this limiting factor? • Why would a farmer want to control the limiting factors for photosynthesis? • Why do farmers need to consider the economic cost of creating certain conditions?
	Achieving (keeping up): I can describe how greenhouses are designed to maximise photosynthesis	
	Excelling (going forward): I can explain how farmers adjust conditions to maintain profit	
4	Emerging (catching up) I can describe how to measure the rate of photosynthesis	• State one other control variable in this experiment. • Explain why each experiment was carried out three times. • What is an anomalous result? • Why were any anomalous results discarded? • How could you improve an investigation?
	Achieving (keeping up): I can write a method to investigate the effect of light intensity on the rate of photosynthesis	
	Excelling (going forward): I can calculate the rate of photosynthesis from reaction data.	

Y9 Biology: Bioenergetics L1 - L10

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
5	Emerging (catching up) I can carry out an investigation to investigate the effect of light intensity on the rate of photosynthesis	•State one other control variable in this experiment. •Explain why each experiment was carried out three times. •What is an anomalous result? •Why were any anomalous results discarded? •How could you improve your investigation?
	Achieving (keeping up): I can use practical equipment to measure length and volume	
	Excelling (going forward): I can carry out a practical investigation safely, understanding the safety measures	
6	Emerging (catching up) I can use the inverse law to calculate light intensity at given distances	•What does it mean when a factor is described as a limiting factor? • Which of the following are not limiting factors of photosynthesis? carbon dioxide concentration, oxygen, chlorophyll availability, light intensity. •Which gas is essential for photosynthesis? •Which part of the plant leaf contains the most chloroplasts? •How does carbon dioxide enter the plant leaves?
	Achieving (keeping up): I can plot a graph of light intensity against rate of photosynthesis	
	Excelling (going forward): I can explain trends shown by a line graph	
7	Emerging (catching up) I can identify appropriate variables	•What is photosynthesis? •What are the main factors affecting the rate of photosynthesis? •How do you investigate the effect of light intensity on photosynthesis? •Why is sodium hydrogencarbonate (NaHCO_3) added to the water in photosynthesis experiments? •What is the relationship between light intensity and the rate of photosynthesis?
	Achieving (keeping up): I can explain improvements and limitations to calculating the rate of photosynthesis	
	Excelling (going forward): I can describe how to investigate the effect of temperature on rate of photosynthesis	
8	Emerging (catching up) I can state the uses of glucose in plants	•What are the four things glucose can be used to synthesise? •What process can glucose be used in? •What other chemical is needed to make proteins? •What is the function of cellulose? •What is the function of lipids and starch?
	Achieving (keeping up): I can describe the relationship between glucose and starch, and describe how to qualitatively test for these	
	Excelling (going forward): I can describe how plants use additional minerals ions to convert glucose into protein	

Y9 Biology: Bioenergetics L1 - L10

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
9	Emerging (catching up) I can recall the word and balanced symbol equations for aerobic respiration	•What three things do organisms need energy for? •Write the word equation for aerobic respiration •Where in the cell does aerobic respiration take place? •Define aerobic respiration •Write glucose in its chemical symbols
	Achieving (keeping up): I can describe where in the cell aerobic respiration takes place	
	Excelling (going forward): I can describe the uses of aerobic respiration in mammals	
10	Emerging (catching up) I can recall the word equations for anaerobic respiration in animal, plant and yeast cells	•Write the word equation for anaerobic respiration in yeast cells •Define fermentation •State the use of carbon dioxide •State the use of ethanol •What is the poisonous waste product of anaerobic respiration?
	Achieving (keeping up): I can compare aerobic and anaerobic respiration	
	Excelling (going forward): I can describe uses the human uses of fermentation and describe muscle fatigue	

Y9 Biology: Bioenergetics

Autumn Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
11	Emerging (catching up) I can describe the ways in which the body responds to exercise.	1) Explain why your heart rate increases during exercise. (3) 2) Explain why your breathing rate increases during exercise. 3) Describe why an oxygen debt arises. (3)
	Achieving (keeping up): I can define oxygen debt.	
	Excelling (going forward): I can explain why changes in heart rate and breathing rate occur during and after exercise.	
12	Emerging (catching up) I can define metabolism.	1) State one example of a metabolic reaction involving glucose in an animal cell. 2) State what nitrate ions can be used for with glucose in a metabolic reaction. 3) State what glucose is stored as in plants. 4) Describe the process by which the liver deals with the lactic acid from anaerobic respiration. (3)
	Achieving (keeping up): I can list and recall metabolic reactions that occur in animal cells.	
	Excelling (going forward): I can explain how a lack of respiration leads to a reduced metabolism and the impact of this	

How is your progress measured in class in Science in **Spring** Term?

Spring 1: Foundations in Chemistry

Chemical Analysis Quiz	A fifteen-minute formative assessment to identify strengths and areas of development. This consists of three sections worth 5 marks each: Section 1: Five multiple choice questions Section 2: Five written retrieval questions Section 3: One extended written response
Chemical Analysis and Atoms, Elements & Compounds	A fifty-minute summative assessment worth 40 marks. This will evaluate understanding of a topic against the curriculum points.

Emerging

Chemical Analysis

I can list examples of common mixtures and pure substances

I can follow a method to carry out paper chromatography

I can identify common gases from a method to test for them

Atoms, Elements & Compounds

I can state examples of elements and compounds

I can state relevant methods to separate mixtures

I can state the mass and charge of subatomic particles

Achieving

Chemical Analysis

I can describe, with examples, the difference between a mixture and a pure substance

I can describe and write a method to carry out paper chromatography accurately

I can describe how to test for common gases

Atoms, Elements & Compounds

I can describe the difference between elements and compounds and identify them from diagrams

I can describe methods to separate specific mixtures

I can describe the arrangement of particles in the nuclear model of the atom

Excelling

Chemical Analysis

I can explain the importance of different formulations in a specific context

I can suggest improvements to methods to improve the accuracy of chromatography

I can explain the importance of testing for gases in industry and health and safety

Atoms, Elements & Compounds

I can identify the compounds formed from unseen elements in both name and symbol formulae

I can explain how state changes and solubility determine the type of separation technique needed

I can explain how changes in the model of the atom were brought about by the alpha-scattering experiment

How is your progress measured in class in Science in **Spring** Term?

Spring 2: Foundations in Chemistry

The Periodic Table Topic test

A fifty-minute summative assessment worth 40 marks. This will evaluate understanding of a topic against the curriculum points.

Emerging

The Periodic Table

I can state that metals are on the left and non-metals on the right of the periodic table

I can draw the electronic configuration of elements between hydrogen and calcium

I can state the reactivity trend of group 1 alkali metals

I can state the reactivity trend of group 7 halogens

Achieving

The Periodic Table

I can describe how individual elements are arranged into groups and periods

I can recall and draw electronic configurations of atoms and ions of hydrogen to calcium

I can explain chemical reactions and reactivity trends of group 1 metals when reacting with water and oxygen

I can explain the chemical reactions and reactivity trends of group 7 halogens in terms of atomic structure and displacement

Excelling

The Periodic Table

I can explain how an element's position on the periodic table determines chemical and physical properties

I can suggest how ions of elements react together, based on the number of electrons in their outer shells

I can design practical investigations to determine the identity of unknown group 1 metals using oxygen, water and group 7 halogens

I can design practical investigations to determine the identity of unknown halogens using group 1 alkali metals and displacement

How is your progress measured in class in Science in **Spring** Term?

Spring 2: Foundations in Chemistry

Structure and bonding topic test

A fifty-minute summative assessment worth 40 marks. This will evaluate understanding of a topic against the curriculum points.

Y9 Chemistry: Chemical analysis

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): I can define and state examples of useful mixtures and pure substances	1) Define 'chemically' pure 2) Explain why orange juice is not chemically pure 3) Describe the difference in boiling point for a pure substance and a mixture 4) Describe how to carry out a practical investigation to decide how pure a substance is
	Achieving (keeping up): I can describe the difference between chemically pure substances and mixtures, both in physical and chemical structure	
	Excelling (going forward): I can design investigations to determine how pure a sample is, and plot graphically	
2	Emerging (catching up): I can describe how to carry out paper chromatography	1) Explain the apparatus that is used to draw the baseline in paper chromatography 2) Describe the role of a lid in paper chromatography 3) State the names of the two phases of chromatography 4) State the pieces of apparatus that match up to the phases of chromatography 5) State the property that separates different solutes in chromatography
	Achieving (keeping up): I can describe the two phases of chromatography and explain how solubility separates solutes in a mixture	
	Excelling (going forward): I can explain in detail how the solubility of a solute determines the length of time spent in the mobile and stationary phase of chromatography	
3	Emerging (catching up): I can identify pure substances and mixtures from a paper chromatogram	1) State the number of spots shown by a pure substance on a chromatogram 2) Label two mixtures onto the chromatogram 3) Describe the solutes that mixtures A and B have in common 4) Make 3 conclusions from mixture C on the chromatogram
	Achieving (keeping up): I can use a chromatogram to identify known solutes across a selection of mixtures	
	Excelling (going forward): I can plan an investigation to identify the pure solutes found in an unknown mixture	

Y9 Chemistry: Chemical analysis

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	Emerging (catching up): I can carry out paper chromatography using a given method	1) Write a complete method to carry out paper chromatography and identify the substances found in a mixture (X).
	Achieving (keeping up): I can write and follow a method to carry out paper chromatography, including making improvements to a method	
	Excelling (going forward): I can explain the importance of using the correct equipment when carrying out paper chromatography	
5	Emerging (catching up): I can use a ruler to measure the distance moved by a solvent and solute	1) State the equation used to calculate the Rf value of a substance 2) Calculate the Rf value of solutes A, B and C 3) Describe the relationship between solubility and Rf value 4) Solute D has an Rf value of 0.9. Calculate the distance moved by the solute
	Achieving (keeping up): I can calculate Rf values from given values and using a paper chromatogram	
	Excelling (going forward): I can rearrange the formula to calculate Rf values and explain how solubility affects the Rf value of substances	
6	Emerging (catching up): I can state common gases and the positive tests for their presence	1) Describe the test for oxygen gas. Include a positive result 2) Describe the positive test for carbon dioxide gas 3) A student places a lit splint into a test tube and nothing happens. Explain what this could be a failed test for 4) Describe the positive test for chlorine gas and explain the importance in testing for chlorine gas.
	Achieving (keeping up): I can describe how to carry out tests for common gases, including positive and negative results	
	Excelling (going forward): I can explain the importance of being able to distinguish between common gases in health and safety	

Y9 Chemistry: Atoms, Elements and Compounds

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): • I can state the definition of an atom, element and compound	1) State the definition of an element. 2) State the definition of a compound. 3) Draw a diagram showing 4 of the same element (use one circle for each). 4) Draw a diagram showing 4 of the same compounds (use two circles for each). 5) Draw a diagram showing 4 elements, 2 are the same and 2 are different (use one circle for each). What would you name this.
	Achieving (keeping up): • I can identify elements and compounds from particle diagrams	
	Excelling (going beyond) • I can draw particle diagrams to represent elements and compounds when given the name of the elements and compounds	
2	Emerging (catching up): • I can name simple compounds that are formed from elements	1) Name the compound formed from a reaction between lithium and oxygen 2) Name the elements that react to make calcium chloride 3) Name the compound formed from magnesium, sulfur and oxygen 4) Identify the elements that form the compound silver nitrate
	Achieving (keeping up): • I can describe and name compounds that are formed from two elements and oxygen	
	Excelling (going beyond): • I can form and identify compounds from multiple elements and compound groups	
3	Emerging (catching up): • I can complete word equations from a description provided	1) Complete the word equation: _____ + magnesium --> magnesium oxide 2) Write a word equation to show a reaction between sodium and chlorine 3) Write a word equation to show a reaction between oxygen, carbon and sodium 4) Suggest how magnesium oxide is formed. Include a word equation.
	Achieving (keeping up): • I can form word equations from given information about chemical reactions	
	Excelling (going beyond): • I can describe practical investigations used that are illustrated by word equations	

Y9 Chemistry: Atoms, Elements and Compounds

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	Emerging (catching up): I can write symbol equations for simple reactions	1) $\text{Be} + \text{O}_2 \rightarrow \text{BeO}$ 2) $\text{K} + \text{F}_2 \rightarrow \text{KF}$ 3) $\text{H}_2 + \text{O}_2 \rightarrow \text{H}_2\text{O}$ 4) $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$ 5) $\text{Mg} + \text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
	Achieving (keeping up): I can balance symbol equations using balancing numbers	
	Excelling (going beyond): I can write balanced symbol equations from scratch from a variety of chemical reactions	
5	Emerging (catching up): I can define and state examples of mixtures	1) State 2 examples of common mixtures 2) Describe the difference between a solvent and a solute 3) Describe how solutions are made 4) Explain why solutions are examples of mixtures 5) Draw a particle diagram to illustrate dissolving
	Achieving (keeping up): I can describe and define the components of various solutions	
	Excelling (going beyond): I can explain how particles of solids dissolve in solvents and illustrate using diagrams	
6	Emerging (catching up): I can identify the apparatus used for filtration and crystallisation	1) State the apparatus needed to carry out filtration 2) State the apparatus needed to carry out crystallisation 3) Describe the steps to filter an insoluble solid from a mixture 4) Describe the steps you would take to obtain salt from a solution of sand and seawater
	Achieving (keeping up): I can state the steps and equipment needed to carry out filtration and crystallisation	
	Excelling (going beyond): I can design a practical investigation that explains how to separate a mixture of sand, salt and water	

Y9 Chemistry: Atoms, Elements and Compounds

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
7	Emerging (catching up): Identify and name the apparatus needed to carry out simple distillation	1. Which piece of apparatus causes the vapour to condense? 2. How is the condenser kept cool? 3. How do we separate 2 or more liquids in a solution? 4. Which substance will evaporate first? 5. What do we use fractional distillation in?
	Achieving (keeping up): Describe, including state changes, how simple distillation separates mixtures	
	Excelling (going beyond): Explain how simple distillation can be used to separate mixtures of multiple liquids	
8	Emerging (catching up): Name the 3 subatomic particles and state their relative mass and charge	1. Name 3 subatomic particles. 2. Describe where each subatomic particle are found. 3. Which subatomic particle are responsible for most of the mass of an atom? 4. State the charge and mass of each subatomic particle. 5. Explain why atom have no overall charge.
	Achieving (keeping up): Describe how the subatomic particles are arranged in the atom	
	Excelling (going beyond): Explain how the arrangement and properties of the atom differ between elements	
9	Emerging (catching up): I can identify and name images of the atom as it has developed over time	1. State the subatomic particle found in the Plum Pudding model 2. Describe the structure of the Plum pudding model 3. Compare the arrangement of the subatomic particles in the Plum Pudding model and Nuclear Model of the atom 4. Describe the results of the alpha-scattering experiment
	Achieving (keeping up): I can compare the structure of the Plum Pudding and Nuclear models of the atom	
	Excelling (going beyond): I can explain how the alpha-scattering experiment led to changes in the model of the atom	

Y9 Chemistry: Atoms, Elements and Compounds

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
10	Emerging (catching up): I can state the discoveries of Niels Bohr and James Chadwick	1) Describe the planetary model of the atom devised by Bohr. 2) State the name of the scientist who discovered neutrons. 3) State the correct order of the scientists that led to nuclear model, starting with the earliest. 4) Sketch a diagram for the planetary model of the atom, labelling the key parts
	Achieving (keeping up): I can describe a timeline of events that has led to the current model of the atom, including the names of key Scientists.	
	Excelling (going beyond): I can sketch diagrams that compare the model of the atom after discoveries by Niels Bohr and James Chadwick	

Y9 Chemistry: The Periodic Table

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
1	Emerging (catching up): I can state the name of Dmitri Mendeleev when asked	1) How did Newlands and Mendeleev organise the elements? 2) What did Newlands use to group elements which Mendeleev then built on? 3) How did Mendeleev group elements? 4) Why were Mendeleev's groups consistent but some of Newlands did not fit the pattern? 5) Give an example of how Mendeleev altered his arrangement to make chemical properties fit
	Achieving (keeping up): I can describe differences between Newlands' and Mendeleev's periodic tables	
	Excelling (going beyond): I can explain how Dmitri Mendeleev organised the periodic table, including how he accounted for elements not yet discovered.	
2	Emerging (catching up): I can identify and locate groups and periods on the periodic table	1) How many protons does Sodium have? 2) How many neutrons does Argon have? 3) How many electrons does the Aluminium atom have? 4) Why are atoms electronically neutral? 5) State two properties which metals have 6) State two properties which non-metals have
	Achieving (keeping up): I can describe how the periodic table is organised	
	Excelling (going beyond): I can explain how an element's position in the periodic table gives it specific chemical and physical properties	
3	Emerging (catching up): I can define isotopes	1) What is an Isotope? 2) Define Relative Atomic Mass 3) What two pieces of information do you need about each isotope in order to calculate the relative atomic mass? 4) Why are these isotopes of each other? 5) find the relative atomic mass of Lithium and Bromine
	Achieving (keeping up): I can describe the difference between isotopes of an element	
	Excelling (going beyond): I can calculate relative atomic mass values from given percentage abundances of isotopes	

Y9 Chemistry: The Periodic Table

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
4	Emerging (catching up): I can draw the electronic configuration of elements between hydrogen and calcium	1) How many electrons can go in each of the 1st 3 electron shells? 2) Sodium has an atomic number of 11; what is its electron configuration? 3) Draw the electrons in a chlorine atom 4) Tellurium is the group 6; how many Electrons are in its outer shell? 5) How many electrons are in the outer shell of Francium? 6) What does the period tell us about amount of electron shells?
	Achieving (keeping up): I can recall and draw electronic configurations of atoms and ions of hydrogen to calcium	
	Excelling (going beyond): I can suggest how ions of elements react together, based on the number of electrons in their outer shell	
5	Emerging (catching up): I can describe how metal and non-metal atoms form ions	1) Describe how metal atoms form ions 2) Describe how non-metal atoms form ions 3) State the charge on an ion formed from a group 7 element 4) Describe how magnesium atoms form ions. Include the charge 5) Describe how oxygen atoms form ions. Include the charge of an oxide ion
	Achieving (keeping up): I can describe how elements in different groups form different ions	
	Excelling (going beyond): I can draw electronic configuration diagrams from ions in group 1, 2, 6 and 7	
6	Emerging (catching up): I can describe observations when group 1 alkali metals react with water and oxygen	1) Why are Group 1 elements named 'Alkali Metals'? 2) What happens when Alkali metals are left exposed to air? 3) How does reactivity change as you move up the group of Group 1 elements? 4) Write the word equation for Lithium reacting with water, including state symbols. 5) Write the balanced symbol equation for Francium reacting with water.
	Achieving (keeping up): I can describe the reactions between alkali metals and water and oxygen, and write word and symbol equations for them	
	Excelling (going beyond): I can use observation evidence to describe a reactivity series and write appropriate word and symbol equations	

Y9 Chemistry: The Periodic Table

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
7	Emerging (catching up): I can describe the reactions that occur between group 1 alkali metals and group 7 halogens	1) What is the trend in reactions of Alkali metals with Chlorine as you move down Group 1? 2) Write a word equation for Chlorine reacting with Caesium 3) Write a balanced symbol equation for Francium reacting with Chlorine, including state symbols. 4) What happens to size of atom as you go down group 1 and how does that effect reactivity? 5) What is the effect of inner electron shells on the outer most electron called which also lowers the electrostatic force between nucleus and electron?
	Achieving (keeping up): I can explain reactivity trends in group 1 alkali metals and describe reactions between group 1 and group 7 elements	
	Excelling (going beyond): I can explain why elements in group 1 and group 7 change physically and chemically when these elements react together	
8	Emerging (catching up): I can describe the physical properties of group 7 elements	1) Name 3 structural properties of Halogens 2) How do Group 7 elements exist in terms of size of molecules? 3) How does size of atoms change as you go down group 7? 4) How does reactivity change as you go down group 7? 5) Why is the reactivity different between Chlorine and Astatine in terms of electronic configuration?
	Achieving (keeping up): I can describe and explain reactivity trends in group 7 halogens	
	Excelling (going beyond): I can explain how position in the periodic table gives group 7 halogens their specific chemical and physical properties	

Y9 Chemistry: The Periodic Table

Summer Term Golden Nuggets and Work Hard

Topic	Golden Nugget	Work Hard
9	Emerging (catching up): I can describe why some group 7 elements are able to displace others, in terms of reactivity	- Describe why fluorine can displace chlorine from a compound - Complete the equation: silver bromide + fluorine $\rightarrow$ - Explain what would be observed in a reaction between potassium fluoride and iodine - Element X displaces element y but cannot displace element z. deduce the reactivity series of these elements
	Achieving (keeping up): I can use displacement reactions to deduce a reactivity series for group 7 elements	
	Excelling (going beyond): I can explain and plan practical investigations using displacement reactions to deduce reactivity series of unknown group 7 elements	
10	Emerging (catching up): I can describe the general reactivity of group 0 noble gases	- What do we call Group 0 elements? - Explain in terms of electron configuration why Group 0 elements are unreactive? - How does the trend of melting point as you go down the group compare to boiling point as you move down the group? - In terms of atoms, compounds and molecules how do Group 0 elements exist? - What happens to density of Group 0 elements as you move up?
	Achieving (keeping up): Explain the reactivity and density trends of group 0 noble gases	
	Excelling (going beyond): I can explain, related to their reactivity, why noble gases are suitable to be used in certain ways	