

## Science Assessment Ladder

Point	Target	Subject	Topic
1	Labels the parts of the respiratory system	Biology	Breathing and Respiration
1	Describe the functions of the respiratory system	Biology	Breathing and Respiration
1	Name the gases exchanged during breathing	Biology	Breathing and Respiration
1	Recall the purpose of gas exchange	Biology	Breathing and Respiration
1	Recall the names of the organs of the circulatory system	Biology	Breathing and Respiration
1	Record data in a table	Biology	Breathing and Respiration
1	Draw a table for data	Biology	Breathing and Respiration
2	Describe how the ribs move and the diaphragm contracts and relaxes to cause ventilation	Biology	Breathing and Respiration
2	State how breathing rate changes with exercise	Biology	Breathing and Respiration
2	Understand that different people have different lung volumes	Biology	Breathing and Respiration
2	Recall that exercise can improve lung volume	Biology	Breathing and Respiration
2	State how breathing changes with exercise	Biology	Breathing and Respiration
2	Describe the pattern in breathing rate shown by my graph	Biology	Breathing and Respiration
2	Recall the structure and function of ciliated cells	Biology	Breathing and Respiration
2	Recall symptoms of asthma	Biology	Breathing and Respiration
2	State that inhalers contain medicine to treat asthma	Biology	Breathing and Respiration
2	Measure breathing rate	Biology	Breathing and Respiration
2	Add an appropriate scale to axis	Biology	Breathing and Respiration
2	Plot data on a graph	Biology	Breathing and Respiration
2	Describe the pattern in breathing rate shown by the graph	Biology	Breathing and Respiration
2	Describe a method to collect gas	Biology	Breathing and Respiration
2	Calculate a mean	Biology	Breathing and Respiration
2	Describe what is shown by a line graph	Biology	Breathing and Respiration
2	State the reactants and products in aerobic respiration	Biology	Breathing and Respiration
2	State that respiration takes place in cells	Biology	Breathing and Respiration
2	Understand that energy released in respiration is needed for growth	Biology	Breathing and Respiration
2	Understand that anaerobic respiration takes place without oxygen	Biology	Breathing and Respiration
2	State the reactant and products in anaerobic respiration in humans	Biology	Breathing and Respiration

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Point	Target	Subject	Topic
2	State that aerobic respiration continues when anaerobic respiration happens in humans	Biology	Breathing and Respiration
2	Recall the major effects of alcohol, cannabis and tobacco on the human body	Biology	Breathing and Respiration
2	Recall that nicotine is addictive	Biology	Breathing and Respiration
2	Understand that alcohol and cannabis are depressants	Biology	Breathing and Respiration
2	Understand that tobacco is a stimulant	Biology	Breathing and Respiration
2	Recall that oxygen and carbon dioxide are exchanged through stomata	Biology	Breathing and Respiration
2	Recall diffusion as the movement of particles from an area of high concentration to an area of low concentration	Biology	Breathing and Respiration
2	Recall the reactants and products of photosynthesis	Biology	Breathing and Respiration
3	Describe the function of the alveoli	Biology	Breathing and Respiration
3	Explain the role of blood in carriage of gases to and from the respiratory system	Biology	Breathing and Respiration
3	Predict how the blood will change as it passes close to the alveoli	Biology	Breathing and Respiration
3	Explain why breathing rate increases with exercise	Biology	Breathing and Respiration
3	Suggest why athletes need efficient lungs	Biology	Breathing and Respiration
3	Explain why breathing rate changes with exercise	Biology	Breathing and Respiration
3	State some triggers of asthma attacks	Biology	Breathing and Respiration
3	Describe what happens to the respiratory system during an asthma attack	Biology	Breathing and Respiration
3	Describe what is shown by a line graph	Biology	Breathing and Respiration
4	Predict breathing rate using the graph	Biology	Breathing and Respiration
4	Draw and label a graph	Biology	Breathing and Respiration
4	Explain why breathing rate changes with exercise	Biology	Breathing and Respiration
4	Draw axis, scale axis and plot a line graph	Biology	Breathing and Respiration
4	Describe the relationship between two variables as shown on a line graph	Biology	Breathing and Respiration
4	Recall the word equation for aerobic respiration	Biology	Breathing and Respiration
4	Understand that the energy released in respiration is used to build proteins and maintain body temperature	Biology	Breathing and Respiration
4	Recall the word equation for anaerobic respiration	Biology	Breathing and Respiration
4	Recall the reactant and products in anaerobic respiration in yeast	Biology	Breathing and Respiration
4	Recall bread-making and wine-making as two uses of fermentation	Biology	Breathing and Respiration

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Point	Target	Subject	Topic
4	Understand that anaerobic respiration provides extra energy for when aerobic respiration cannot provide energy quickly enough	Biology	Breathing and Respiration
4	Describe the effects that alcohol, cannabis and tobacco have on the brain, liver and respiratory system	Biology	Breathing and Respiration
4	Describe how drug use affects sporting performance	Biology	Breathing and Respiration
4	Recognize the stomata on an image of a leaf cross-section	Biology	Breathing and Respiration
4	Recognise that the products of photosynthesis are the reactants of aerobic respiration	Biology	Breathing and Respiration
4	Recognise that the products of aerobic respiration are the reactants of photosynthesis	Biology	Breathing and Respiration
5	Explain how alveoli increase surface area for gas exchange	Biology	Breathing and Respiration
5	Recall the features of red blood cells that help in the transport of gases	Biology	Breathing and Respiration
6	Explain why breathing rate and respiration increase during exercise	Biology	Breathing and Respiration
6	Describe asthma treatment as being medicines that prevent attacks and ease the symptoms of attacks	Biology	Breathing and Respiration
6	Plot data from more than one exercise onto a graph	Biology	Breathing and Respiration
6	Explain the relationship between two variables shown on a line graph	Biology	Breathing and Respiration
6	Explain why the air we breathe out is different to the air we breathe in	Biology	Breathing and Respiration
6	Recall that aerobic respiration takes place in the cytoplasm and mitochondria	Biology	Breathing and Respiration
6	Describe the consequences of a build-up of lactic acid in muscles	Biology	Breathing and Respiration
6	Suggest how the effects of alcohol, cannabis and tobacco reduce sporting performance	Biology	Breathing and Respiration
6	Identify photosynthesis as essential for animal life to exist as it produces oxygen and glucose	Biology	Breathing and Respiration
6	Describe guard cells as controlling the opening of the stomata in leaves for gas exchange	Biology	Breathing and Respiration
1	Name the seven life processes	Biology	Cells and Organisation
1	Name the main structures in all cells, including animal cells - nucleus, cytoplasm and cell membrane.	Biology	Cells and Organisation
1	State the functions of the nucleus, cytoplasm and cell membrane.	Biology	Cells and Organisation
1	Name the parts of the light microscope	Biology	Cells and Organisation
1	Prepare a cheek cell slide	Biology	Cells and Organisation
1	Use a light microscope to view cells	Biology	Cells and Organisation
1	Name the main parts of a plant cell: nucleus, cytoplasm, cell membrane, cell wall, vacuole, chloroplast.	Biology	Cells and Organisation
1	State the function of parts of plant cells	Biology	Cells and Organisation
1	List the similarities and differences between animal and plant cells	Biology	Cells and Organisation
1	State that some organisms are only a single cell	Biology	Cells and Organisation
1	Recognise single-celled organisms because of their structural adaptations	Biology	Cells and Organisation

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Point	Target	Subject	Topic
2	Understand that cells become damaged or worn out and are replaced by new cells	Biology	Cells and Organisation
2	Recall that the nucleus contains the genetic material which are the instructions for making new cells	Biology	Cells and Organisation
2	Recognise that new cells are made when existing cells divide	Biology	Cells and Organisation
2	Remember that cells all have some parts which are the same but specialise to do different jobs	Biology	Cells and Organisation
2	Identify some specialised cells	Biology	Cells and Organisation
2	State the function of some specialised cells:	Biology	Cells and Organisation
2	Nerve cells carry messages around the body.	Biology	Cells and Organisation
2	Red blood cells carry oxygen from the lungs to other parts of the body.	Biology	Cells and Organisation
2	Sperm cells contain the father's genetic information and pass it to the egg cell.	Biology	Cells and Organisation
2	Root hair cells have a large surface area to absorb water in plants.	Biology	Cells and Organisation
2	Remember that tissues are groups of cells of the same kind that work together	Biology	Cells and Organisation
2	Recall the names of some tissues such as muscle tissue (made of muscle cells), skin tissue (made of skin cells), heart tissue (made of heart muscle cells), brain tissue (made of brain cells)	Biology	Cells and Organisation
2	State that organs are groups of tissues working together to perform a function	Biology	Cells and Organisation
2	Give the names of some organs of the human body and the organ system they belong to i.e. the heart belongs to the circulatory system, the lungs belong to the respiratory system, the stomach and intestines belong to the digestive system, the ovaries belong to the female reproductive system, the brain belongs to the nervous system	Biology	Cells and Organisation
2	Identify organ systems from diagrams	Biology	Cells and Organisation
2	Know how the systems of the body keep us alive	Biology	Cells and Organisation
2	Find information in some text	Biology	Cells and Organisation
2	Put forward a viewpoint based on simple evidence or reasoning	Biology	Cells and Organisation
2	Understand the organising objects and organisms allows us to identify them more easily	Biology	Cells and Organisation
2	Group objects and organisms based on similarities and differences	Biology	Cells and Organisation
2	State that vertebrates are animals with backbones and invertebrates are animals without backbones	Biology	Cells and Organisation
2	Name the five vertebrate groups	Biology	Cells and Organisation
2	List the features of the 5 vertebrates groups:	Biology	Cells and Organisation
2	Mammals have fur, give birth to live young and feed their young on milk.	Biology	Cells and Organisation
2	Fish have gills and scales and lay eggs in water.	Biology	Cells and Organisation
2	Birds have feathers and lay eggs with hard shells.	Biology	Cells and Organisation
2	Reptiles have dry scales and lay eggs with tough leathery shells.	Biology	Cells and Organisation
2	Amphibians can live in and out of water and lay eggs in water.	Biology	Cells and Organisation
2	Understand that a species is a group of animals which are very similar to each other	Biology	Cells and Organisation

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Point	Target	Subject	Topic
2	Use a simple key	Biology	Cells and Organisation
3	State the function of the mitochondria	Biology	Cells and Organisation
3	Describe how to prepare a cheek cell slide	Biology	Cells and Organisation
3	Describe chloroplast as where plants make their own food in a process called photosynthesis	Biology	Cells and Organisation
3	State that unicellular organisms gain food, water, and oxygen by diffusion	Biology	Cells and Organisation
3	Describe respiration as a process using oxygen to release energy from food	Biology	Cells and Organisation
3	Describe chloroplasts as the place where plants make a sugar called glucose in process called respiration	Biology	Cells and Organisation
4	Explain diffusion as the movement of particles from an area of high concentration to an area of low concentration	Biology	Cells and Organisation
4	Recognise that cells which can develop to become any type of cell are called stem cells	Biology	Cells and Organisation
4	Identify features that make red blood cells, sperm cells, ciliated cells, nerve cells, palisade cells, and root hair cells different to other cells	Biology	Cells and Organisation
4	Name many organs of the human body and state which system they belong to	Biology	Cells and Organisation
4	Name the main organ systems in the human body	Biology	Cells and Organisation
4	Understand some problems are difficult to answer, these are ethical questions	Biology	Cells and Organisation
4	Recognise a straight forward impact or consequence from an action	Biology	Cells and Organisation
4	State a conclusion supported by at least one piece of relevant evidence or data	Biology	Cells and Organisation
4	Be able to defend a classification system	Biology	Cells and Organisation
4	Construct a simple key	Biology	Cells and Organisation
4	Describe phagocytosis	Biology	Cells and Organisation
4	Recall the process of cell division as: 1. The nucleus is copied, 2. The cell divides into two identical cells, 3. The cell grows and becomes specialised	Biology	Cells and Organisation
4	Explain how the features of a specialised cell allow it to carry out it's function	Biology	Cells and Organisation
4	Name some organs in flowering plants and their functions	Biology	Cells and Organisation
4	Be able to suggest some ethical questions around the issue of organs donation and transplant	Biology	Cells and Organisation
4	Justify a conclusion based on several pieces of evidence or data	Biology	Cells and Organisation
4	Describe a number of impacts or consequences of an action	Biology	Cells and Organisation
4	Understand that taxonomy is the grouping of living things down to species level	Biology	Cells and Organisation
1	Identify simple chemical reactions	Chemistry	Chemical reactions
2	Identify what is needed for complete combustion and the products made	Chemistry	Chemical reactions
2	Investigate whether all carbonates behave/ react in the same way.	Chemistry	Chemical reactions
2	Recall that in chemical reaction, the atoms rearrange themselves to form new products	Chemistry	Chemical reactions
2	Give examples of oxidation reactions	Chemistry	Chemical reactions
2	Describe the reactivity series	Chemistry	Chemical reactions
2	Identify an acid or alkali	Chemistry	Chemical reactions

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Point	Target	Subject	Topic
2	Recall how you can use indicators to test for acids and alkalis	Chemistry	Chemical reactions
2	Record observations and describe patterns and trends in results	Chemistry	Chemical reactions
2	Describe the test for hydrogen	Chemistry	Chemical reactions
4	Explain what happens in a chemical reaction	Chemistry	Chemical reactions
4	Give examples of every day combustion reactions	Chemistry	Chemical reactions
4	Write word equations for different thermal decomposition reactions	Chemistry	Chemical reactions
4	Write word equations for these reactions	Chemistry	Chemical reactions
4	Explain what a displacement reaction is	Chemistry	Chemical reactions
4	Write word equations for different combustion reactions	Chemistry	Chemical reactions
4	Identify the pH of a solution using universal indicator	Chemistry	Chemical reactions
4	Make a range of indicators to test for acids and alkalis using plant materials	Chemistry	Chemical reactions
4	Explain what a neutralisation reaction is	Chemistry	Chemical reactions
4	Write word equations for neutralisation reactions	Chemistry	Chemical reactions
4	Describe how you can use indicators to test for acids and alkalis	Chemistry	Chemical reactions
4	Relate what you have learnt about neutralisation reactions and apply it to a real life situation	Chemistry	Chemical reactions
6	Use diagrams of atoms to explain simple chemical reaction	Chemistry	Chemical reactions
6	Use diagrams of atoms to explain simple chemical reaction	Chemistry	Chemical reactions
6	Write symbolic equations for simple chemical reactions	Chemistry	Chemical reactions
6	Use role-play to demonstrate displacement reactions	Chemistry	Chemical reactions
1	Identify the different layers of the Earth	Chemistry	Earth and Atmosphere
1	Describe what the atmosphere is	Chemistry	Earth and Atmosphere
1	Identify some examples of igneous rocks	Chemistry	Earth and Atmosphere
1	Identify some examples of sedimentary rocks	Chemistry	Earth and Atmosphere
1	Identify some examples of metamorphic rocks	Chemistry	Earth and Atmosphere
1	Identify different types of weathering	Chemistry	Earth and Atmosphere
1	Describe the three steps that take place after a rock has weathered	Chemistry	Earth and Atmosphere
1	Identify different materials that can be recycled	Chemistry	Earth and Atmosphere
1	Show how carbon is recycled in the carbon cycle	Chemistry	Earth and Atmosphere
1	Describe how carbon dioxide is released into the atmosphere	Chemistry	Earth and Atmosphere
3	Describe in detail the composition of the Earth	Chemistry	Earth and Atmosphere
3	Identify the percentages of gases that make up the Earth's atmosphere	Chemistry	Earth and Atmosphere
3	Describe how igneous rocks are formed	Chemistry	Earth and Atmosphere
3	Describe some key features of sedimentary rocks	Chemistry	Earth and Atmosphere
4	Explain how metamorphic rocks are formed	Chemistry	Earth and Atmosphere
4	Describe the processes of weathering	Chemistry	Earth and Atmosphere
4	Explain how sediment is transported through the process of erosion	Chemistry	Earth and Atmosphere
4	Describe the different stages of the Rock Cycle	Chemistry	Earth and Atmosphere
4	Describe the importance of natural resources from the earth to humans	Chemistry	Earth and Atmosphere
4	Describe the arguments for and against recycling	Chemistry	Earth and Atmosphere

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Point	Target	Subject	Topic
4	Describe the movement of carbon in the carbon cycle	Chemistry	Earth and Atmosphere
4	Explain the impact of human activity on climate change	Chemistry	Earth and Atmosphere
5	Identify the elements found in the Earth's crust using their symbol	Chemistry	Earth and Atmosphere
5	Explain how the atmosphere has changed overtime since the Earth was first formed	Chemistry	Earth and Atmosphere
5	Explain how the size of crystals is evidence of the rate of cooling	Chemistry	Earth and Atmosphere
5	Use evidence in sedimentary rocks to explain how they were formed	Chemistry	Earth and Atmosphere
5	Can compare the properties of metamorphic rock to igneous and sedimentary rocks	Chemistry	Earth and Atmosphere
5	Can explain the different examples of weathering	Chemistry	Earth and Atmosphere
5	Explain the processes involved in the rock cycle	Chemistry	Earth and Atmosphere
6	Explain the issues surrounding the overuse and depletion of the Earth's resources	Chemistry	Earth and Atmosphere
6	Evaluate the effectiveness of recycling	Chemistry	Earth and Atmosphere
6	Explain in detail the changes that occur in the carbon cycle	Chemistry	Earth and Atmosphere
6	Suggest ways of tackling climate change	Chemistry	Earth and Atmosphere
1	Recall the circuit symbol and function of a cell, battery, buzzer, motor, ammeter, and variable resistor.	Physics	Electricity
1	Recall that electric current is measured in amperes (A), using an ammeter	Physics	Electricity
1	Recognise a complete circuit	Physics	Electricity
1	Describe an electric current as a flow of particles, called electrons	Physics	Electricity
1	Recognise that current will heat up a wire	Physics	Electricity
1	Use circuit diagrams to rank bulbs in order of brightness	Physics	Electricity
1	Predict the ammeter readings anywhere in a series circuit	Physics	Electricity
1	Explain why a circuit needs to be complete for a current to flow	Physics	Electricity
1	Explain why the current is the same everywhere in circuit connected in series	Physics	Electricity
1	Recognise that electric cells are a store of chemical energy	Physics	Electricity
2	Recall that voltage is also called potential difference	Physics	Electricity
2	Recognise that unlike charges attract and like charges repel	Physics	Electricity
2	Recognise that when cells are added in series the voltages add together	Physics	Electricity
2	Add voltmeters to circuit diagrams to show how to measure the voltage across components	Physics	Electricity
2	State the effect of adding more batteries on the brightness of the bulbs in a circuit	Physics	Electricity
2	Recall that voltage is the energy shifted by electrical working	Physics	Electricity
2	Recognise that the total voltage across the components in a series circuit adds up to the voltage of the battery	Physics	Electricity
2	Use data to calculate missing voltages in series circuit	Physics	Electricity

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Point	Target	Subject	Topic
2	Explain why adding more batteries affects the brightness of the bulbs in a circuit	Physics	Electricity
3	Predict the ammeter readings anywhere in a parallel circuit	Physics	Electricity
3	Explain why the current entering the branches of a parallel circuit is the same as the total current leaving them	Physics	Electricity
3	Use ideas about current to explain ammeter reading in series circuits	Physics	Electricity
3	Suggest how the current will change when the power supply or components are altered for both series and parallel circuits	Physics	Electricity
3	Recognise that the total voltage across each branch in a parallel circuit is the same	Physics	Electricity
3	Use data to calculate missing voltages in parallel circuits	Physics	Electricity
4	Explain why the current in a circuit depends on the voltage of the battery	Physics	Electricity
4	Give a reason why charges lose energy as they travel round a series circuit	Physics	Electricity
4	Give a simple explanation for an effect caused by static electricity	Physics	Electricity
4	Suggest how changes to series and parallel circuits will change the voltages across the components	Physics	Electricity
5	Use ideas about current to explain ammeter readings in series and parallel circuits	Physics	Electricity
5	Predict, with reasons, how the current will change when the power supply or components are altered in series or parallel circuits	Physics	Electricity
5	Design a circuit to solve a problem. Describe what components are needed and whether they need to be linked in series or parallel.	Physics	Electricity
6	Use ideas about current and resistance, to explain ammeter readings in series and parallel circuits	Physics	Electricity
6	Use ideas about current and resistance, to explain ammeter readings in series and parallel circuits	Physics	Electricity
6	Use ideas about resistance to predict, with reasons, how the current will change when the power supply or components are altered in series or parallel circuits	Physics	Electricity
6	Design a circuit to solve a problem. Describe what components are needed, whether they will be linked in series or parallel, and use ideas about current and resistance to explain how it works.	Physics	Electricity
6	Use ideas about energy to explain the voltages across components in series and parallel	Physics	Electricity
6	Use ideas about electric charges to explain the properties of static electricity	Physics	Electricity
6	Predict, with reasons, how changes to series and parallel circuits will change the voltages across their components	Physics	Electricity
6	Design series and parallel circuits that provide enough voltage for unfamiliar components	Physics	Electricity

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Point	Target	Subject	Topic
6	Use ideas about energy and charge to explain the voltages across components in series and parallel	Physics	Electricity
6	Use ideas about electric charges, conductors and insulators to explain the properties of static electricity	Physics	Electricity
6	Predict, with reasons based on charge and energy, how changes to series and parallel circuits will change the voltages across their components	Physics	Electricity
6	Design series and parallel circuits that provide enough voltage for unfamiliar components, and use ideas about energy to explain how they work.	Physics	Electricity
1	Recall the circuit symbol and function of a cell, battery, buzzer, motor, ammeter, and variable resistor.	Physics	Electromagnetism
1	Recall that electric current is measured in amperes (A), using an ammeter	Physics	Electromagnetism
1	Recognise a complete circuit	Physics	Electromagnetism
2	Describe an electric current as a flow of particles, called electrons	Physics	Electromagnetism
2	Recognise that current will heat up a wire	Physics	Electromagnetism
2	Use circuit diagrams to rank bulbs in order of brightness	Physics	Electromagnetism
2	Predict the ammeter readings anywhere in a series circuit	Physics	Electromagnetism
2	Explain why a circuit needs to be complete for a current to flow	Physics	Electromagnetism
2	Explain why the current is the same everywhere in a series circuit	Physics	Electromagnetism
2	Recognise that electric cells are a store of electrical energy	Physics	Electromagnetism
2	Recall that voltage is also called potential difference	Physics	Electromagnetism
2	Recognise that when cells are added in series the voltages add together	Physics	Electromagnetism
2	Add voltmeters to circuit diagrams to show how to measure the voltage across components	Physics	Electromagnetism
2	State the effect of adding more batteries on the brightness of the bulbs in a circuit	Physics	Electromagnetism
2	Recall that voltage is the energy shifted by electrical working	Physics	Electromagnetism
2	Recognise that the total voltage across the components in a series circuit adds up to the voltage of the battery	Physics	Electromagnetism
2	Use data to calculate missing voltages in series circuit	Physics	Electromagnetism
2	explain why adding more batteries affects the brightness of the bulbs in a circuit	Physics	Electromagnetism
2	Recognise that magnets have poles, and that like poles repel, unlike poles attract	Physics	Electromagnetism
2	Recall that the Earth behaves like a giant magnet	Physics	Electromagnetism
2	Recall how to magnetise or demagnetise steel	Physics	Electromagnetism
2	Recall how to make an electromagnet	Physics	Electromagnetism
2	Recall the definition of a magnetic field	Physics	Electromagnetism
2	Identify metals that are magnetic	Physics	Electromagnetism
2	Deduce the poles of a magnet by whether they repel or attract another magnet	Physics	Electromagnetism

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Point	Target	Subject	Topic
2	Draw the arrangement of domains in a piece of magnetised metal	Physics	Electromagnetism
2	Recognise the shape of the magnetic field around a bar magnet, electromagnet or the Earth	Physics	Electromagnetism
2	Recognise factors that change the strength of a magnet or electromagnet	Physics	Electromagnetism
2	Predict the direction of force on a magnetic material at a point in a magnetic field	Physics	Electromagnetism
2	explain simple magnetic effects using the idea of poles	Physics	Electromagnetism
2	Draw the arrangements of magnetic domains in different situations	Physics	Electromagnetism
2	Label a diagram of an electric motor	Physics	Electromagnetism
3	Predict the ammeter readings anywhere in a parallel circuit	Physics	Electromagnetism
3	Explain why the current entering the branches of a parallel circuit is the same as the total current leaving them	Physics	Electromagnetism
3	Use ideas about current to explain ammeter reading in series circuits	Physics	Electromagnetism
3	Suggest how the current will change when the power supply or components are altered in series to parallel circuits	Physics	Electromagnetism
4	Recognise that the total voltage across each branch in a parallel circuit is the same	Physics	Electromagnetism
4	Use data to calculate missing voltages in parallel circuits	Physics	Electromagnetism
4	Explain why the current in a circuit depends on the voltage of the battery	Physics	Electromagnetism
4	Give a reason why charges lose energy as they travel round a series circuit	Physics	Electromagnetism
4	Suggest how changes to series and parallel circuits will change the voltages across the components	Physics	Electromagnetism
4	Recall reasons why Earth behaves like a magnet	Physics	Electromagnetism
4	Compare the strength of a magnetic field at different places, using the idea of field lines	Physics	Electromagnetism
4	Explain simple magnetic effects using the idea of poles and magnetic fields	Physics	Electromagnetism
4	Describe the main features of domain theory	Physics	Electromagnetism
4	Explain how magnets can be made or destroyed with reasons	Physics	Electromagnetism
4	Explain how magnets are attracted by the Earth's magnetic field	Physics	Electromagnetism
4	Suggest, with a reason, how an electromagnet's strength would be affected by changing various factors	Physics	Electromagnetism
4	Describe how an electric motor works	Physics	Electromagnetism
5	Use ideas about current to explain ammeter readings in series and parallel circuits	Physics	Electromagnetism
5	Predict, with reasons, how the current will change when the power supply or components are altered in series or parallel circuits	Physics	Electromagnetism
5	Design a circuit to solve a problem. Describe what components are needed and whether they need to be linked in series or parallel.	Physics	Electromagnetism

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Point	Target	Subject	Topic
6	Use ideas about current and resistance, to explain ammeter readings in series and parallel circuits	Physics	Electromagnetism
6	Use ideas about current and resistance, to explain ammeter readings in series and parallel circuits	Physics	Electromagnetism
6	Use ideas about resistance to predict, with reasons, how the current will change when the power supply or components are altered in series or parallel circuits	Physics	Electromagnetism
6	Design a circuit to solve a problem. Describe what components are needed, whether they will be linked in series or parallel, and use ideas about current and resistance to explain how it works.	Physics	Electromagnetism
6	Use ideas about energy to explain the voltages across components in series and parallel	Physics	Electromagnetism
6	Predict, with reasons, how changes to series and parallel circuits will change the voltages across their components	Physics	Electromagnetism
6	Design series and parallel circuits that provide enough voltage for unfamiliar components	Physics	Electromagnetism
6	Use ideas about energy and charge to explain the voltages across components in series and parallel	Physics	Electromagnetism
6	Recall that voltage is the energy shifted by each unit of charge	Physics	Electromagnetism
6	Predict, with reasons based on charge and energy, how changes to series and parallel circuits will change the voltages across their components	Physics	Electromagnetism
6	Design series and parallel circuits that provide enough voltage for unfamiliar components, and use ideas about energy to explain how they work.	Physics	Electromagnetism
6	Use ideas about domain theory to explain how magnets can be made or destroyed	Physics	Electromagnetism
6	Use ideas about magnetic poles to explain how objects are affected by the Earth's magnetic field	Physics	Electromagnetism
6	Use ideas about magnetic fields to predict the effect of changing various factors in the design of an electromagnet	Physics	Electromagnetism
6	Design a device to solve a specific problem using a magnet or electromagnet	Physics	Electromagnetism
6	Explain how magnets can be made, destroyed or controlled using the ideas of domain theory and field strength	Physics	Electromagnetism
6	Use ideas about magnetic poles to explain how objects are affected by the Earth's magnetic field and show you appreciate it is three-dimensional	Physics	Electromagnetism
6	Use ideas about domain theory and magnetic fields to predict the effect of changing various factors in the design of an electromagnet	Physics	Electromagnetism
6	Design a device to solve a specific problem using a magnet or electromagnet, and use ideas about domain theory or magnetic fields to explain how it works	Physics	Electromagnetism
6	Use Fleming's Left Hand Rule to find out which way a motor will turn	Physics	Electromagnetism

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Point	Target	Subject	Topic
1	Sort materials into metals and non metals	Chemistry	Elements, Compounds and Mixtures
1	Sort substances into elements or compounds given a particle diagram	Chemistry	Elements, Compounds and Mixtures
2	Use a periodic table to find out the symbol of an element, given its name	Chemistry	Elements, Compounds and Mixtures
2	Recognise the difference between compound and mixtures	Chemistry	Elements, Compounds and Mixtures
2	Describe some methods used to separate simple mixtures	Chemistry	Elements, Compounds and Mixtures
3	Evaluate a simple model for describing how elements and compounds/mixtures are different	Chemistry	Elements, Compounds and Mixtures
3	Use the periodic table to predict properties of unfamiliar elements	Chemistry	Elements, Compounds and Mixtures
3	Describe the structure of atoms	Chemistry	Elements, Compounds and Mixtures
4	Interpret chemical formulae	Chemistry	Elements, Compounds and Mixtures
4	Use a particle model to show what happens in a chemical reaction	Chemistry	Elements, Compounds and Mixtures
4	Explain why mass is conserved when solutions are made	Chemistry	Elements, Compounds and Mixtures
4	Use a particle model to explain why a solution of copper sulphate is blue	Chemistry	Elements, Compounds and Mixtures
4	Explain how different separating techniques work	Chemistry	Elements, Compounds and Mixtures
4	Distinguish between mixtures and pure compounds/elements by referring to the boiling/ freezing point.	Chemistry	Elements, Compounds and Mixtures
4	Use a model to show how atoms, elements and compounds are different from each other	Chemistry	Elements, Compounds and Mixtures
4	Describe the ways in which elements vary in their atomic structure, appearance and state	Chemistry	Elements, Compounds and Mixtures
4	Use a simple model to describe how elements and compounds/mixtures are different	Chemistry	Elements, Compounds and Mixtures
4	Describe the ways elements are arranged on the periodic table	Chemistry	Elements, Compounds and Mixtures
4	Recognise the atoms which make up a compound from its formula	Chemistry	Elements, Compounds and Mixtures
4	Describe difference between elements that make up a compound and the compound itself	Chemistry	Elements, Compounds and Mixtures
4	Use the idea of particles to explain what dissolving is	Chemistry	Elements, Compounds and Mixtures
4	Use knowledge about specific mixtures e.g. sand and water, to suggest how similar mixtures might be separated	Chemistry	Elements, Compounds and Mixtures
5	Suggest improvements to a proposed model	Chemistry	Elements, Compounds and Mixtures
5	Make links between the properties of a material and the particles it is made from	Chemistry	Elements, Compounds and Mixtures
5	Given some similar examples, construct the formulae of some simple compounds	Chemistry	Elements, Compounds and Mixtures
6	Use the particle model of matter to explain how a solvent can be separated from a solute by a process involving a change in state	Chemistry	Elements, Compounds and Mixtures
6	Use the pattern of solubility data to predict solubility at higher and lower temperatures	Chemistry	Elements, Compounds and Mixtures

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
2	Understand that energy shifted from one store always turns up in another store	Physics	Energy
2	Know that changes in an internal (or thermal) store of energy are linked to changes in temperature	Physics	Energy
2	Know that changes in a gravitational store of energy are linked to changes in height	Physics	Energy
2	Know that changes in a kinetic store of energy are linked to changes in speed	Physics	Energy
2	Know that changes in an elastic store of energy are linked to stretching, squashing an object	Physics	Energy
2	Identify the energy stores in an energy description of a change.	Physics	Energy
2	Know that when a battery (electrical cell) is used energy is shifted from chemical store of energy	Physics	Energy
2	Can add up the energy shifted when food is used	Physics	Energy
2	Know that when food is used energy is shifted from a chemical store	Physics	Energy
2	Understand that what can be done is limited by the energy available in an energy store	Physics	Energy
2	Know that a megajoule (MJ) is 1000,000 joule	Physics	Energy
2	Know that a kilojoule (kJ) is 1000 joule.	Physics	Energy
2	Know that other units of energy are the Calorie (kcal) and the calorie (cal)	Physics	Energy
2	Know that the joule (J) is the unit of energy	Physics	Energy
2	Know that energy can be measured	Physics	Energy
4	Know that energy pathways describe how energy is shifted between stores	Physics	Energy
4	Can name four energy pathways: 1. mechanical working, 2. electrical working, 3. heating by particle movement, 4. heating by radiation	Physics	Energy
4	Can describe events in terms of the energy pathways involved	Physics	Energy
4	Be able to identify when an event involves changes in kinetic, elastic, kinetic, chemical or internal (thermal) stores of energy	Physics	Energy
4	Can describe events in terms of shifts of energy between imaginary stores of energy [to include situations involving kinetic, elastic, kinetic, chemical or internal (thermal) stores]:	Physics	Energy
4	An elastic store is filled (or emptied) when material is stretched or squeezed (or relaxed)	Physics	Energy
4	Kinetic store is filled (or emptied) when an object speeds up (or slows down)	Physics	Energy
4	A chemical store is emptied (or filled) when atoms combine (or are separated)	Physics	Energy
4	An internal (or thermal) store is filled (or emptied) when a material warms up (or cools down)	Physics	Energy
6	Understand that energy is always conserved. If all stores are considered the total energy remains constant: energy shifted from one store always turns up in another store	Physics	Energy
6	Understand that it is possible to calculate the change of energy of each store and the shifts of energy that occur as events happen	Physics	Energy

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
6	Understand that it is possible to calculate the rate at which energy is shifted along an energy pathway	Physics	Energy
6	Can describe , in terms of shifts of energy between stores. more complex examples, such as a pendulum, that involve dissipation of energy: transfer of energy to an internal (thermal) store	Physics	Energy
6	Can describe an event in terms of both shifts of energy between imaginary stores of energy and the energy pathways involved [to include situations involving kinetic, elastic, kinetic, chemical or internal (thermal) vibrational and electromagnetic stores]	Physics	Energy
6	A vibrational store is filled (or emptied) when the amplitude of a vibration increases (or decreases)	Physics	Energy
6	An electromagnetic store is filled or emptied when magnets or charged particles alter separation	Physics	Energy
6	Be aware of the idea of a nuclear store of energy which fills or empties during nuclear fission, nuclear fusion and radioactive decay	Physics	Energy
1	Draw forces as arrows. The size of the force is shown by the length of the arrow. The arrow points in the direction of the force.	Physics	Forces
1	Recall that the unit of force is the newton (N)	Physics	Forces
1	Recall that objects normally keep moving at constant speed; a force will make an object change speed or direction.	Physics	Forces
1	Give examples of units of speed. Measure a time using a stopwatch.	Physics	Forces
1	Recall the unit of speed as metre per second	Physics	Forces
2	Recall that weight is a force so is measured in newtons.	Physics	Forces
2	Recall that mass is measured in kilograms.	Physics	Forces
2	Objects fall because of the gravitational attraction of the Earth	Physics	Forces
3	Describe the effect of a force on the motion of an object	Physics	Forces
3	Describe the effect of a force (and absence of a force) from both Newtonian and Aristotelian points of view.	Physics	Forces
3	Explain various examples in terms of the Newtonian point of view.	Physics	Forces
3	Calculate average speed from a distance and a time.	Physics	Forces
4	Describe mass as the property of an object that makes it difficult to change its speed.	Physics	Forces
4	Describe weight as the force of gravity acting on an object	Physics	Forces
4	Make calculations of weight when given a mass in kg. Use the words mass and weight appropriately in different contexts.	Physics	Forces
4	In the absence of air resistance all objects (heavy and light) fall at the same rate.	Physics	Forces
4	Suggest factors that affect the rate of fall (terminal speed) of an object in air.	Physics	Forces
5	Describe the motion of an object in the absence of a force.	Physics	Forces

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
5	Describe the effect of two forces on the motion of an object.	Physics	Forces
5	Compare the Newtonian and Aristotelian viewpoints and state their own position relative to these points of view.	Physics	Forces
5	Explain more complex examples in terms of the Newtonian point of view.	Physics	Forces
5	Make links between force and energy based descriptions of situations	Physics	Forces
5	Calculate distance from average speed and time taken.	Physics	Forces
6	Make more complex calculations of weight when given a mass (for example: mass given in grams, non-Earth gravitational field strength)	Physics	Forces
6	Describe in words the forces acting on a falling object.	Physics	Forces
6	Draw a diagram to show the forces acting on a falling object.	Physics	Forces
6	Justify factors that affect the rate of fall (terminal speed) of an object in air.	Physics	Forces
1	Some changes are reversible and some are irreversible.	Chemistry	Particles
1	Some substances will expand when heated and contract when cooled.	Chemistry	Particles
1	Name some substances that dissolve in water.	Chemistry	Particles
1	Some substances dissolve when mixed with water.	Chemistry	Particles
2	Describe the process of diffusion.	Chemistry	Particles
2	Describe some properties of solids, liquids and gases.	Chemistry	Particles
2	Substances are made of particles.	Chemistry	Particles
2	Use the words melt, freeze, condense and evaporate.	Chemistry	Particles
2	Group materials into Solids, Liquids and Gases.	Chemistry	Particles
3	Use data to list materials in order of density	Chemistry	Particles
3	Recall the definitions of solute, solvent and solution.	Chemistry	Particles
3	Relate changes of state to temperature change.	Chemistry	Particles
3	Know that changes of state are reversible changes.	Chemistry	Particles
4	Describe the changes that happen when a material changes state.	Chemistry	Particles
4	Use particle diagrams to explain the process of diffusion	Chemistry	Particles
4	Use the idea of particles to explain the properties of solids, liquids and gases.	Chemistry	Particles
4	Describe the arrangement of particles in solids, liquids and gases.	Chemistry	Particles
4	Use descriptions of substances and decide whether they are solid, liquid or gas.	Chemistry	Particles
4	Predict the particle arrangement of dense and less dense materials.	Chemistry	Particles
4	When solids dissolve in liquids, the total mass does not change.	Chemistry	Particles
4	Draw particle diagrams to illustrate solutions.	Chemistry	Particles
4	Explain expansion and contraction using the idea of particles.	Chemistry	Particles

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
4	Label cooling/heating curves with the terms melting, boiling, freezing and condensing.	Chemistry	Particles
4	Use models to explain what happens when a material changes state.	Chemistry	Particles
4	Explain how particles vibrate at different temperatures.	Chemistry	Particles
1	Find an element on the Periodic table	Chemistry	Patterns of Reactivity
1	State the physical properties of metals and non-metals	Chemistry	Patterns of Reactivity
2	Name some important metals and match them to their uses	Chemistry	Patterns of Reactivity
2	Follow instructions safely	Chemistry	Patterns of Reactivity
2	State that metals can be listed in a reactivity series	Chemistry	Patterns of Reactivity
2	Use a periodic table to find the symbol for an element	Chemistry	Patterns of Reactivity
4	Identify the group and period number for a given element	Chemistry	Patterns of Reactivity
4	Investigate or measure physical properties	Chemistry	Patterns of Reactivity
4	State why metals are chosen for a particular use	Chemistry	Patterns of Reactivity
4	Make detailed observations and measurements	Chemistry	Patterns of Reactivity
4	Describe the ways elements are arranged on the periodic table	Chemistry	Patterns of Reactivity
4	Describe the properties of the Halogens (Group 7)	Chemistry	Patterns of Reactivity
4	Describe the properties of the Group 1 Metals	Chemistry	Patterns of Reactivity
4	Describe the properties of the Transition Metals	Chemistry	Patterns of Reactivity
4	Identify an element from details about its physical properties and location on the Periodic Table	Chemistry	Patterns of Reactivity
4	Predict properties of unknown substances based on their position in the Periodic Table	Chemistry	Patterns of Reactivity
4	Observe and describe the properties of given samples	Chemistry	Patterns of Reactivity
4	Make deductions from observations and measurements	Chemistry	Patterns of Reactivity
4	Make links between the outcome of displacement reactions and a metals position in the reactivity series	Chemistry	Patterns of Reactivity
4	Describe the correct extraction technique based on a metals position in the reactivity series	Chemistry	Patterns of Reactivity
4	Use the periodic table to predict properties of unfamiliar elements	Chemistry	Patterns of Reactivity
5	Explain some of the physical properties of metals and non-metals	Chemistry	Patterns of Reactivity
5	Explain some of the physical properties of metals	Chemistry	Patterns of Reactivity
5	Explain how the properties of the metal make it a suitable choice for a particular use	Chemistry	Patterns of Reactivity
6	Explain, using chemical equations, what is happening during a chemical reaction properties of given samples	Chemistry	Patterns of Reactivity
6	Explain, using chemical equations, what is happening during a displacement reaction	Chemistry	Patterns of Reactivity
6	Explain, using chemical equations what is happening during reduction of copper oxide	Chemistry	Patterns of Reactivity
6	Make links between the properties of a material and the particles it is made from	Chemistry	Patterns of Reactivity
6	Use graphical methods to predict properties of unknown substances	Chemistry	Patterns of Reactivity

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
6	Compare the financial and social impact of extraction techniques	Chemistry	Patterns of Reactivity
1	State where an embryo or fetus gets its nutrients from	Biology	Reproduction
1	State the effects of alcohol, smoking and drugs on the health of the mother and baby	Biology	Reproduction
1	State that gametes contain half the number of chromosomes of a body cell	Biology	Reproduction
1	State that fertilisation happens in the oviduct	Biology	Reproduction
1	Sequence the events of a baby's developments in the uterus	Biology	Reproduction
1	Recognise that some couples have difficulties becoming pregnant	Biology	Reproduction
1	Recall basic dietary needs and link to the health of the baby and mother	Biology	Reproduction
1	Outline the stages in development of the embryo and fetus	Biology	Reproduction
1	Outline the functions of the male reproductive system	Biology	Reproduction
1	Outline the functions of the female reproductive system	Biology	Reproduction
1	Name the structures of the male reproductive system	Biology	Reproduction
1	Name the structures of the female reproductive system	Biology	Reproduction
1	Name the parts of flowers	Biology	Reproduction
1	Name the male and female gametes and state where they are produced	Biology	Reproduction
2	Match the age of an embryo or fetus to its appearance	Biology	Reproduction
2	Label on a diagram the parts of the male and female reproductive organs: Ovary, Testes, Penis, Uterus, Oviduct	Biology	Reproduction
2	Know the keywords: Sperm, Egg, Ovary, Uterus, Testes, Penis, Fertilisation, Embryo, Oviduct	Biology	Reproduction
2	Identify where sperm are deposited and where fertilisation takes place	Biology	Reproduction
2	Identify what could happen to the seeds consider how the seeds may be different (prediction)	Biology	Reproduction
2	Identify the problems that may occur with the reproductive system to prevent fertilisation occurring	Biology	Reproduction
2	Identify that the fertilised egg is called a zygote	Biology	Reproduction
2	Identify and describe the sequence of events during the menstrual cycle	Biology	Reproduction
2	Describe the structure of seeds as embryos	Biology	Reproduction
2	Describe the role of the placenta	Biology	Reproduction
2	Describe the events leading up to and just after birth	Biology	Reproduction
2	Describe the changes that take place during puberty	Biology	Reproduction
2	Describe pollination by insects and wind	Biology	Reproduction
2	Describe dispersal of seeds by wind	Biology	Reproduction
2	Recognise that plants have male and female reproductive parts	Biology	Reproduction
2	Identify the nucleus in cells as the instructions for an individual	Biology	Reproduction

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
3	Know that genetic information is carried on chromosomes which are built up of genes and are made from a substance called DNA	Biology	Reproduction
3	Sequence the events that lead to fertilisation	Biology	Reproduction
3	Recognise that growth is more than an increase in size and describe some factors that affect growth	Biology	Reproduction
3	Predict how different factors may affect the germination of the seeds	Biology	Reproduction
4	Outline the basic steps in in-vitro fertilisation	Biology	Reproduction
4	Outline fertilisation in plants and link to humans i.e. male and female gametes	Biology	Reproduction
4	Identify that the fertilised egg is the fusion of the male and female nucleus	Biology	Reproduction
4	Identify causes of infertility	Biology	Reproduction
4	Explain, using suitable models and analogies, the functions of major organs and tissues in the reproductive systems in animals	Biology	Reproduction
4	Explain the purpose of fruit in seed dispersal	Biology	Reproduction
4	Explain the links between healthy diet and development of the fetus	Biology	Reproduction
4	Explain the functions of the male and female flower parts	Biology	Reproduction
4	Describe what could happen if the step did not occur	Biology	Reproduction
4	Describe the function of the placenta in more detail, and identify the type of substances that should move from mother to baby and vice versa	Biology	Reproduction
4	Describe cross-pollination and self-pollination in plants	Biology	Reproduction
4	Describe the benefits of each step in a fetus's development. Describe what could happen if the step did not occur	Biology	Reproduction
5	State that the genes control the inherited characteristics from the parents	Biology	Reproduction
5	Explain, using models and analogies, how different organs, tissues and cells in the reproductive system are adapted to carry out their function, e.g. fallopian tube, uterus, egg and sperm cells, pollen grains, umbilical cord, amniotic sac	Biology	Reproduction
5	Explain why seeds become dormant	Biology	Reproduction
5	Explain why gametes contain half the number of chromosomes	Biology	Reproduction
5	Explain the effects of substances from smoking, alcohol and other drugs on the fetus	Biology	Reproduction
5	Explain the benefits of each step, and problems that may occur if the step did not happen	Biology	Reproduction
5	Explain In vitro fertilisation	Biology	Reproduction
5	Explain in detail fertilisation in plants and link to humans i.e. male and female gametes	Biology	Reproduction
5	Explain the factors that affect the growth of seeds	Biology	Reproduction
1	Identify the main bones in the Human body (spine, skull, rib cage, femur, tibia, fibula, humerus, ulna and radius).	Biology	Skeleton, Muscles, Nutrition and Disease
1	Identify the various functions of the skeleton	Biology	Skeleton, Muscles, Nutrition and Disease
1	Identify 4 different types of joint in the human body from diagrams	Biology	Skeleton, Muscles, Nutrition and Disease

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
1	State the function of tendons.	Biology	Skeleton, Muscles, Nutrition and Disease
1	Describe, using a diagram, how the hinge joint works	Biology	Skeleton, Muscles, Nutrition and Disease
1	Recall the position of named muscles - add labels to a diagram	Biology	Skeleton, Muscles, Nutrition and Disease
1	State that muscles are in antagonistic pairs.	Biology	Skeleton, Muscles, Nutrition and Disease
1	Identify the 7 main food groups	Biology	Skeleton, Muscles, Nutrition and Disease
1	Identify 2 types of food for each food group	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify the main ways to test for fat, protein starch and sugar	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify 3 enzymes,	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify the four main types of microbe	Biology	Skeleton, Muscles, Nutrition and Disease
2	Describe a pathogen.	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify 4 ways the body stops pathogens from entering the body	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify 4 ways pathogens could be transmitted	Biology	Skeleton, Muscles, Nutrition and Disease
2	Identify the main types of white blood cells	Biology	Skeleton, Muscles, Nutrition and Disease
2	Recognise antibody structure. Draw an antibody shape	Biology	Skeleton, Muscles, Nutrition and Disease
2	Recognise that some bacteria have become resistant to antibiotics	Biology	Skeleton, Muscles, Nutrition and Disease
2	State ways that antibiotics should be used	Biology	Skeleton, Muscles, Nutrition and Disease
3	Recall the position of these bones in the human body (create a model and label a diagram correctly)	Biology	Skeleton, Muscles, Nutrition and Disease
3	Identify the position of ligaments: Ligaments hold bones together and are crossed over as they move over the bones. They are at the joints	Biology	Skeleton, Muscles, Nutrition and Disease
3	Explain the roles of the tissues involved with joints in the body	Biology	Skeleton, Muscles, Nutrition and Disease
3	Describe how each food group is used in the body	Biology	Skeleton, Muscles, Nutrition and Disease
3	Describe the main laboratory tests for fat, protein and carbohydrates include positive and negative results.	Biology	Skeleton, Muscles, Nutrition and Disease
3	Describe the functions of enzymes with examples	Biology	Skeleton, Muscles, Nutrition and Disease
4	Describe the features of each type of microbe including size. Use this space to describe the features you could use a mind map idea.	Biology	Skeleton, Muscles, Nutrition and Disease
4	Recall method of reproduction for each of the 4 types of microbe.	Biology	Skeleton, Muscles, Nutrition and Disease
4	Describe the function of three types of white blood cell (phagocyte, memory and antibody making) cells	Biology	Skeleton, Muscles, Nutrition and Disease
4	Describe antibody function.	Biology	Skeleton, Muscles, Nutrition and Disease

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
4	Explain in outline how bacteria can become resistant to antibiotics	Biology	Skeleton, Muscles, Nutrition and Disease
5	Identify and recall the position of bones (tarsals-metatarsals, carpals and meta-carpals, cranium and jaw, patella)	Biology	Skeleton, Muscles, Nutrition and Disease
5	Explain the function of the ligaments: why are they needed to hold the bones together?	Biology	Skeleton, Muscles, Nutrition and Disease
5	Explain and describe the mechanics behind a hinge joint	Biology	Skeleton, Muscles, Nutrition and Disease
5	Explain what is meant by an antagonistic pair	Biology	Skeleton, Muscles, Nutrition and Disease
6	Explain why each food group is needed in the body in detail	Biology	Skeleton, Muscles, Nutrition and Disease
6	Explain the functions of enzymes with examples	Biology	Skeleton, Muscles, Nutrition and Disease
6	Explain how vaccines work.	Biology	Skeleton, Muscles, Nutrition and Disease
6	Explain why vaccines are important to UK health.	Biology	Skeleton, Muscles, Nutrition and Disease
6	Explain in detail how bacteria become resistant to antibiotics	Biology	Skeleton, Muscles, Nutrition and Disease
1	All sound travels as vibrations in materials	Physics	Sound and Light
1	The bigger the vibrations, the bigger the sound	Physics	Sound and Light
1	A sound travels from its source in all directions	Physics	Sound and Light
1	In Longitudinal waves, the vibrations are in the same direction	Physics	Sound and Light
1	In transverse waves, the vibrations are parallel to the direction of the wave	Physics	Sound and Light
1	Sound waves are longitudinal waves	Physics	Sound and Light
1	Sound travels through a gas, liquid and solid	Physics	Sound and Light
1	Sound waves cannot travel in empty space	Physics	Sound and Light
1	Ultrasound waves can be used for cleaning	Physics	Sound and Light
1	Reflection is when a wave bounces off a surface	Physics	Sound and Light
1	Reflected sound is called an echo	Physics	Sound and Light
1	A cathode ray oscilloscope (CRO) is an instrument to measure waves.	Physics	Sound and Light
2	Amplitude is the height of the wave	Physics	Sound and Light
2	The higher the wave on the screen, the louder the wave	Physics	Sound and Light
2	Scientists measure loudness in decibels, dB	Physics	Sound and Light
2	Sound vibrations spread in all directions	Physics	Sound and Light
2	Bigger vibrations make bigger sounds	Physics	Sound and Light
2	Frequency is the number of vibrations (waves) per second.	Physics	Sound and Light
2	Frequency is measured in hertz (Hz)	Physics	Sound and Light
2	Pitch is linked to frequency	Physics	Sound and Light
2	Animals can hear higher frequency sounds	Physics	Sound and Light
2	The higher the frequency, the higher the pitch	Physics	Sound and Light
2	The lower the frequency, the lower the pitch	Physics	Sound and Light
2	The wavelength of a wave is the distance between two peaks	Physics	Sound and Light
2	Label the different parts of the ear	Physics	Sound and Light
2	Tiny hairs- cilia – hang down into the liquid.	Physics	Sound and Light
2	Very loud sounds push the hairs down too far. They are damaged forever and damages hearing.	Physics	Sound and Light
2	Light travels from the source as waves	Physics	Sound and Light
2	Light travels in straight lines	Physics	Sound and Light

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
2	White light is made of many colours – the colours of the rainbow	Physics	Sound and Light
2	We see the colours when white light splits up	Physics	Sound and Light
2	Filters are put in front of spotlights to make different colours	Physics	Sound and Light
2	A blue filter lets blue light through. It absorbs red and green light	Physics	Sound and Light
2	Light has three primary colours: red, blue and green. (this is different from paint primary colours!)	Physics	Sound and Light
2	Secondary colours are made by mixing primary colours :	Physics	Sound and Light
2	· blue + green = cyan	Physics	Sound and Light
2	· blue + red = magenta	Physics	Sound and Light
2	· red + green = yellow	Physics	Sound and Light
2	All three primary colours = white light	Physics	Sound and Light
2	Mirrors reflect light	Physics	Sound and Light
2	· The incident ray travels towards the mirror .	Physics	Sound and Light
2	· The reflected ray leaves the mirror at the same angle.	Physics	Sound and Light
2	When light passes from one medium (gas, liquid or a solid) to another it changes direction. This is called refraction.	Physics	Sound and Light
2	Know the difference between a convex and concave lens	Physics	Sound and Light
2	Waves seem to bend when they pass through a narrow gap. This is called diffraction.	Physics	Sound and Light
2	Light can travel through any medium – solid, liquid, gas or even empty space.	Physics	Sound and Light
2	Light travels faster than sound	Physics	Sound and Light
2	A shadow is a dark image cast on the ground when an object blocks the light	Physics	Sound and Light
3	Waves transfer energy by mechanical working	Physics	Sound and Light
3	When you hit a drum, the air particles next to it vibrate. The particles are squashing together and then further apart.	Physics	Sound and Light
3	Vibrating particles make up a sound wave.	Physics	Sound and Light
3	In longitudinal waves, the vibrations and energy transfer are in the same direction	Physics	Sound and Light
3	In transverse waves, the vibrations and energy transfer are perpendicular to each other. Light and water waves are transverse waves.	Physics	Sound and Light
3	Wave energy moves through material	Physics	Sound and Light
3	Sound cannot travel through a vacuum because there are no particles to vibrate	Physics	Sound and Light
3	Reflected sound is called an echo. The further you are from a surface, the longer it takes to hear the echo.	Physics	Sound and Light
4	Amplitude is related to the energy transferred by any wave:	Physics	Sound and Light
4	The higher the wave on the oscilloscope screen, the louder the sound	Physics	Sound and Light
4	For light, the bigger the amplitude means the light will be brighter	Physics	Sound and Light
4	In water, the bigger the amplitude of the waves, the higher they will be.	Physics	Sound and Light
4	The amplitude is measured from the centre of the wave to the peak or trough of the wave.	Physics	Sound and Light

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
4	When the frequency is high, the wavelength is small.	Physics	Sound and Light
4	How sound waves carry energy into your ear:	Physics	Sound and Light
4	· Your eardrum passes on the vibrations to the tiny bones of your middle ear- the ossicles	Physics	Sound and Light
4	· The vibrating ossicles transfer energy to the cochlea. Here they travel through a liquid.	Physics	Sound and Light
4	· Tiny hairs-called cilia- hang down into the liquid. Vibrations travelling through the liquid push the hairs.	Physics	Sound and Light
4	· Nerve cells on the hairs detect this movement.	Physics	Sound and Light
4	· You hear the sound.	Physics	Sound and Light
4	Light is travelling energy from the source	Physics	Sound and Light
4	White light is made of many colours. We see the colours when white light splits up	Physics	Sound and Light
4	Light travels faster in solids.	Physics	Sound and Light
4	Refraction is when light bends slightly as it travels from one medium into another. This happens because the light speed changes e.g. When light travels from air into glass or plastic, it slows down.	Physics	Sound and Light
4	Light waves don't need particles to transfer energy so light can travel through any medium – even a vacuum (empty space).	Physics	Sound and Light
4	A kaleidoscope has a triangle of mirrors	Physics	Sound and Light
4	A periscope has two mirrors, one at the top, one at the bottom. By getting the mirrors at exactly the right angle, you can see over a wall or fence.	Physics	Sound and Light
4	To make a shadow puppet theatre, put a blank screen in front of a light source.	Physics	Sound and Light
5	There is a convex lens in your eye. The lens refracts light, and focusses it onto your retina.	Physics	Sound and Light
5	In a short-sighted eye, light focusses in front of retina	Physics	Sound and Light
5	The different colours in white light bend by different amounts. This is because each colour has a different wavelength.	Physics	Sound and Light
6	Frequency is inversely proportional to wavelength.	Physics	Sound and Light
6	The speed of sound can be calculated using the equation: speed = frequency x wavelength	Physics	Sound and Light
6	The eardrum is a membrane that vibrates as incoming waves reach it. A higher pitch will mean more vibrations per second, causing the eardrum to vibrate with a higher frequency.	Physics	Sound and Light
6	The three tiny bones of the middle ear act as levers to amplify the vibrations of the sound wave.	Physics	Sound and Light
1	Recognise products and reactants in a word equation	Chemistry	Using Chemicals
1	Follow instructions safely	Chemistry	Using Chemicals
2	State that metals react with oxygen	Chemistry	Using Chemicals
2	State that a temperature change is a sign of a chemical reaction	Chemistry	Using Chemicals
2	Describe the properties of ceramics, polymers and composites	Chemistry	Using Chemicals

Science Key Stage 3 Assessment Ladder

Point	Target	Subject	Topic
3	Recognise products and reactants in a symbol equation	Chemistry	Using Chemicals
3	State that catalysts speed up reactions	Chemistry	Using Chemicals
3	State that metals react with oxygen at different rates	Chemistry	Using Chemicals
3	Identify an exothermic or endothermic reaction	Chemistry	Using Chemicals
3	Write a testable hypothesis	Chemistry	Using Chemicals
4	Plan an investigation to test a hypothesis	Chemistry	Using Chemicals
4	Record data in a table with correct units	Chemistry	Using Chemicals
4	List advantages and disadvantages of different materials	Chemistry	Using Chemicals
4	Write word equations for simple chemical reactions	Chemistry	Using Chemicals
4	Use experimental data to confirm that catalyst speed up chemical reactions	Chemistry	Using Chemicals
4	Describe the trend in the reaction of metals with oxygen	Chemistry	Using Chemicals
4	Describe the observation of temperature during an exothermic or endothermic reaction	Chemistry	Using Chemicals
4	Consider a scientific question and the factors that may affect the outcome leading to a testable hypothesis	Chemistry	Using Chemicals
4	Draw a graph of collected data	Chemistry	Using Chemicals
4	Describe how polymers are made up of repeat units	Chemistry	Using Chemicals
4	Suggest, with reasons, a sensible material for a purpose	Chemistry	Using Chemicals
5	Write symbol equations for simple chemical reactions	Chemistry	Using Chemicals
5	Use the trend in metal reactions with oxygen to make predictions	Chemistry	Using Chemicals
5	Explain the temperature change in exothermic or endothermic reaction in terms of transfer of energy	Chemistry	Using Chemicals
5	Explain the extent that collected data supports or refute a hypothesis	Chemistry	Using Chemicals
5	Evaluate the quality of collected data	Chemistry	Using Chemicals
5	Evaluate the use of a particular material for a purpose	Chemistry	Using Chemicals
6	Explain how these long chain lead to strong yet flexible materials	Chemistry	Using Chemicals
6	Evaluate the use of polymers for everyday items	Chemistry	Using Chemicals
6	Balance symbol equations for simple chemical reactions	Chemistry	Using Chemicals