

Obj No	Physics - Forces	Started (/) Completed (X)	Level Achieved
	1.1.1 Introduction to forces		
1	Describe what forces do		1 2 3 4 5 6 7 8
2	Identify a 'contact force', 'non-contact force', and 'newton'		1 2 3 4 5 6 7 8
3	Use a newtonmeter to make predictions about sizes of forces		1 2 3 4 5 6 7 8
4	Categorise everyday forces as 'contact' and 'non-contact' forces		1 2 3 4 5 6 7 8
5	Identify interaction pairs in a simple situation		1 2 3 4 5 6 7 8
6	Interpret force diagrams used to illustrate problems involving gravity		1 2 3 4 5 6 7 8
7	Describe what 'interaction pair' means		1 2 3 4 5 6 7 8
8	Identify interaction pairs in complex situations		1 2 3 4 5 6 7 8
9	Explain the link between non-contact forces, contact forces, and interaction pairs		1 2 3 4 5 6 7 8
10	Make predictions about pairs of forces acting in unfamiliar situations		1 2 3 4 5 6 7 8

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	1.1.2 Balanced and unbalanced		
1	Identify familiar situations of balanced and unbalanced forces		1 2 3 4 5 6 7 8
2	Recognise equilibrium		1 2 3 4 5 6 7 8
3	Identify a resultant force		1 2 3 4 5 6 7 8
4	Identify when the speed or direction of motion of an object changes		1 2 3 4 5 6 7 8
5	Present observations in a table with help		1 2 3 4 5 6 7 8
6	Draw a force diagram for a problem involving gravity		1 2 3 4 5 6 7 8
7	Describe the difference between balanced and unbalanced forces		1 2 3 4 5 6 7 8
8	Describe situations that are in equilibrium		1 2 3 4 5 6 7 8
9	Calculate resultant forces		1 2 3 4 5 6 7 8
10	Explain why the speed or direction of motion of objects can change		1 2 3 4 5 6 7 8
11	Explain the difference between balanced and unbalanced forces		1 2 3 4 5 6 7 8
12	Describe a range of situations that are in equilibrium		1 2 3 4 5 6 7 8
13	Describe the link between the resultant force and the motion of an object		1 2 3 4 5 6 7 8
14	Explain why the speed or direction of motion of objects can change using force arrows		1 2 3 4 5 6 7 8

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	1.1.3 Speed		
1	State the equation for speed and use it to calculate speed, with support		1 2 3 4 5 6 7 8
2	Recognise relative motion		1 2 3 4 5 6 7 8
3	Use appropriate techniques and equipment to measure times and distances		1 2 3 4 5 6 7 8
4	Calculate speed using the speed equation		1 2 3 4 5 6 7 8
5	Describe relative motion		1 2 3 4 5 6 7 8
6	Choose equipment to make appropriate measurements for time and distance to calculate speed		1 2 3 4 5 6 7 8
7	Use the speed equation to explain unfamiliar situations		1 2 3 4 5 6 7 8
8	Describe and explain how a moving object appears to a stationary observer and to a moving observer		1 2 3 4 5 6 7 8
9	Choose equipment to obtain data for speed calculations, justifying their choice based on accuracy and precision		1 2 3 4 5 6 7 8

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	1.1.4 Distance-time graphs		
1	Describe simply what a distance–time graph shows		1 2 3 4 5 6 7 8
2	Use a distance–time graph to describe a journey qualitatively		1 2 3 4 5 6 7 8
3	Present data given on a distance–time graph, with support		1 2 3 4 5 6 7 8
4	Calculate speed from a distance–time graph, with support		1 2 3 4 5 6 7 8
5	Interpret distance–time graphs		1 2 3 4 5 6 7 8
6	Calculate speed from a distance–time graph and convert between units		1 2 3 4 5 6 7 8
7	Plot data on a distance–time graph accurately		1 2 3 4 5 6 7 8
8	Draw distance–time graphs for a range of journeys		1 2 3 4 5 6 7 8
9	Manipulate data appropriately to present in a distance–time graph		1 2 3 4 5 6 7 8

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	1.2.1 Gravity		
1	Describe the difference between mass and weight		1 2 3 4 5 6 7 8
2	Describe simply how gravity varies with mass and distance		1 2 3 4 5 6 7 8
3	State the force that holds planets and moons in orbit around larger bodies		1 2 3 4 5 6 7 8
4	State g on the Earth and the moon		1 2 3 4 5 6 7 8
5	Describe how gravity due to an object changes if the mass or the distance from the object changes		1 2 3 4 5 6 7 8
6	Use a formula (weight = mass $\times$ g) to work out your weight on different planets, and compare it to your weight on Earth		1 2 3 4 5 6 7 8
7	Compare and contrast gravity with other forces		1 2 3 4 5 6 7 8
8	Explain how the effect of gravity changes moving away from Earth, and in keeping objects in orbit		1 2 3 4 5 6 7 8
9	Analyse data about orbits in terms of the variation of gravity with mass and distance		1 2 3 4 5 6 7 8

Obj No	Physics - Electromagnets	Started (/) Completed (X)	Level Achieved
	2.1.1 Potential difference		
1	State the unit of potential difference		1 2 3 4 5 6 7 8
2	Name the equipment used to measure potential difference		1 2 3 4 5 6 7 8
3	Describe the effect of a larger potential difference		1 2 3 4 5 6 7 8
4	Describe what is meant by potential difference		1 2 3 4 5 6 7 8
5	Describe how to measure potential difference		1 2 3 4 5 6 7 8
6	Describe what is meant by the rating of a battery or bulb		1 2 3 4 5 6 7 8
7	Set up a simple circuit and use appropriate equipment to measure potential difference		1 2 3 4 5 6 7 8
8	Explain why potential difference is measured in parallel		1 2 3 4 5 6 7 8
9	Predict the effect of changing the rating of a battery or bulb in a circuit		1 2 3 4 5 6 7 8
10	Set up and measure potential difference across various components in a circuit		1 2 3 4 5 6 7 8
11	Explain the difference between potential difference and current		1 2 3 4 5 6 7 8

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	2.1.2 Resistance		
1	Calculate the resistance from values of p.d. and current with support		1 2 3 4 5 6 7 8
2	Compare simply the resistance of conductors and insulators		1 2 3 4 5 6 7 8
3	List examples of conductors and insulators		1 2 3 4 5 6 7 8
4	Identify some of the variables in the investigation		1 2 3 4 5 6 7 8
5	Describe what is meant by resistance		1 2 3 4 5 6 7 8
6	Calculate resistance of a circuit		1 2 3 4 5 6 7 8
7	Describe the difference between conductors and insulators in terms of resistance		1 2 3 4 5 6 7 8
8	Identify independent, dependent, and control variables		1 2 3 4 5 6 7 8
9	Explain the causes of resistance		1 2 3 4 5 6 7 8
10	Explain what factors affect the resistance of a resistor		1 2 3 4 5 6 7 8
11	Compare the effect of resistance in different materials		1 2 3 4 5 6 7 8
12	Independently select and control all the variables in the investigation, considering accuracy and precision		1 2 3 4 5 6 7 8

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	2.1.3 Series and parallel		
1	State one difference between series and parallel circuits		1 2 3 4 5 6 7 8
2	State how potential difference varies in series and parallel circuits		1 2 3 4 5 6 7 8
3	Describe the difference between series and parallel circuits		1 2 3 4 5 6 7 8
4	Describe how potential difference varies in series and parallel circuits		1 2 3 4 5 6 7 8
5	Identify the pattern of potential difference in series and parallel circuits		1 2 3 4 5 6 7 8
6	Predict the effect of changing the resistance of a circuit component on the overall (net) resistance of the circuit		1 2 3 4 5 6 7 8
7	Explain why potential difference varies in series and parallel circuits		1 2 3 4 5 6 7 8
8	Explain the pattern in potential difference readings for series and parallel circuits, drawing conclusions		1 2 3 4 5 6 7 8



Obj No	Physics - Electromagnets	Started (/) Completed (X)	Level Achieved
	2.2.1 Current		
1	State what current is		1 2 3 4 5 6 7 8
2	Use an ammeter to measure current		1 2 3 4 5 6 7 8
3	Identify the pattern of current in series and parallel circuits		1 2 3 4 5 6 7 8
4	Describe how current changes in series and parallel circuits when components are changed		1 2 3 4 5 6 7 8
5	Describe how to measure current		1 2 3 4 5 6 7 8
6	Set up a circuit including an ammeter to measure current		1 2 3 4 5 6 7 8
7	Use a model to explain how current flows in a circuit		1 2 3 4 5 6 7 8
8	Predict the current in different circuits		1 2 3 4 5 6 7 8
9	Measure current accurately in a number of places in a series circuit		1 2 3 4 5 6 7 8
10	Explain the pattern in current readings for series and parallel circuits, drawing conclusions		1 2 3 4 5 6 7 8

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	2.2.2 Charging up		
1	Describe how to charge insulators		1 2 3 4 5 6 7 8
2	State the two types of charge		1 2 3 4 5 6 7 8
3	State what surrounds charged objects		1 2 3 4 5 6 7 8
4	Describe what happens when you bring similarly charged object together, and when you bring differently charged objects together		1 2 3 4 5 6 7 8
5	Use a sketch to explain how objects can become charged		1 2 3 4 5 6 7 8
6	Describe how charged objects interact		1 2 3 4 5 6 7 8
7	Describe what is meant by an electric		1 2 3 4 5 6 7 8
8	Interpret observations, identifying patterns linked to charge		1 2 3 4 5 6 7 8
9	Explain, in terms of electrons, why something becomes charged		1 2 3 4 5 6 7 8
10	Predict how charged objects will interact		1 2 3 4 5 6 7 8
11	Suggest ways to reduce the risk of getting electrostatic shocks		1 2 3 4 5 6 7 8
12	Use observations to make predictions		1 2 3 4 5 6 7 8

Obj No	Physics - Energy	Started (/) Completed (X)	Level Achieved
	3.1.1 Food and fuels		
1	Identify energy values for food and fuels		1 2 3 4 5 6 7 8
2	Describe energy requirements in different situations		1 2 3 4 5 6 7 8
3	Interpret data on food intake for some activities		1 2 3 4 5 6 7 8
4	Compare the energy values of food and fuels		1 2 3 4 5 6 7 8
5	Compare the energy in food and fuels with the energy needed for different activities		1 2 3 4 5 6 7 8
6	Explain data on food intake and energy requirements for a range of activities		1 2 3 4 5 6 7 8
7	Calculate energy requirements for various situations, considering diet and exercise		1 2 3 4 5 6 7 8
8	Suggest different foods needed in unusual situations, for example, training for the Olympics		1 2 3 4 5 6 7 8
9	Explain why an athlete needs more energy from food using data provided		1 2 3 4 5 6 7 8

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	3.1.2 Energy resources		
1	Name renewable and non-renewable energy resources.		1 2 3 4 5 6 7 8
2	State one advantage and one disadvantage of fossil fuels		1 2 3 4 5 6 7 8
3	Use one source of information		1 2 3 4 5 6 7 8
4	Name a renewable resource used to generate electricity		1 2 3 4 5 6 7 8
5	Describe the difference between a renewable and a non-renewable energy resource		1 2 3 4 5 6 7 8
6	Describe how electricity is generated using a fossil fuel or a renewable resource		1 2 3 4 5 6 7 8
7	Choose an appropriate source of secondary information		1 2 3 4 5 6 7 8
8	Compare renewable and non-renewable resources		1 2 3 4 5 6 7 8
9	Explain how a range of resources generate electricity, drawing on scientific concepts		1 2 3 4 5 6 7 8
10	Justify the choice of secondary information		1 2 3 4 5 6 7 8
11	Suggest actions a government or communities could take in response to rising energy demand		1 2 3 4 5 6 7 8

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	3.1.3 Energy and power		
1	State the definitions of energy and power		1 2 3 4 5 6 7 8
2	State that power, fuel used, and cost are linked		1 2 3 4 5 6 7 8
3	Predict which equipment is more powerful when given a selection of appliances		1 2 3 4 5 6 7 8
4	Explain the difference between energy and power		1 2 3 4 5 6 7 8
5	Describe the link between power, fuel use, and cost of using domestic appliances		1 2 3 4 5 6 7 8
6	Predict the power requirements of different home devices, and compare their energy usage and how much they cost to run		1 2 3 4 5 6 7 8
7	Compare the power consumption of different appliances		1 2 3 4 5 6 7 8
8	Calculate and compare energy costs in different scenarios		1 2 3 4 5 6 7 8
9	Predict the effect on energy bills of changing the power of		1 2 3 4 5 6 7 8

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	3.2.1 Energy adds up		
1	State the definition of the conservation of energy		1 2 3 4 5 6 7 8
2	State how energy is transferred		1 2 3 4 5 6 7 8
3	Present simple observations of energy transfers		1 2 3 4 5 6 7 8
4	Describe energy stores before and after a change, including stores relating to an object's speed, temperature, height or shape		1 2 3 4 5 6 7 8
5	Explain what brings about transfers in energy between stores		1 2 3 4 5 6 7 8
6	Present observations of energy transfers in a table		1 2 3 4 5 6 7 8
7	Apply ideas about stores and transfers to a range of unfamiliar situations		1 2 3 4 5 6 7 8
8	Compare energy transfers to energy conservation		1 2 3 4 5 6 7 8
9	Present detailed observations of energy transfers in a table, explaining changes to the physical system, and how that relates to the ways in which energy is stored		1 2 3 4 5 6 7 8

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	3.2.2 Energy dissipation		
1	State what dissipation means		1 2 3 4 5 6 7 8
2	Do simple calculations of wasted energy from input and useful energies		1 2 3 4 5 6 7 8
3	State what lubrication and streamlining mean		1 2 3 4 5 6 7 8
4	Explain how energy is dissipated in a range of situations		1 2 3 4 5 6 7 8
5	Calculate useful energy and wasted energy from input and output energies		1 2 3 4 5 6 7 8
6	Describe how dissipated energy can be reduced		1 2 3 4 5 6 7 8
7	Account for all energy transfers in a range of situations		1 2 3 4 5 6 7 8
8	Calculated a useful energy and wasted energy, and efficiency		1 2 3 4 5 6 7 8
9	Evaluate methods of reducing energy dissipation		1 2 3 4 5 6 7 8

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	4.1.1 Sound waves and speed		
1	Name some sources of sound		1 2 3 4 5 6 7 8
2	Name materials that sound can travel through		1 2 3 4 5 6 7 8
3	State that sound travels at 330 m/s in air, a million times more slowly than light		1 2 3 4 5 6 7 8
4	Use data to compare the speed of sound in different materials		1 2 3 4 5 6 7 8
5	Describe how sound is produced and travels		1 2 3 4 5 6 7 8
6	Explain observations where sound is transmitted by different media		1 2 3 4 5 6 7 8
7	Contrast the speed of sound and the speed of light		1 2 3 4 5 6 7 8
8	Compare the time for sound to travel in different materials using data given		1 2 3 4 5 6 7 8
9	Explain what is meant by supersonic travel		1 2 3 4 5 6 7 8
10	Describe sound as the transfer of energy through vibrations and explain why sound cannot travel through a vacuum		1 2 3 4 5 6 7 8
11	Compare the time taken for sound and light to travel the same distance		1 2 3 4 5 6 7 8



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	4.1.2 Loudness and amplitude		
1	Define amplitude, frequency, and wavelength		1 2 3 4 5 6 7 8
2	State the link between loudness and amplitude		1 2 3 4 5 6 7 8
3	State two things that can happen when sound goes through matter or hits a boundary		1 2 3 4 5 6 7 8
4	Label amplitude on a diagram of an oscilloscope trace of a wave		1 2 3 4 5 6 7 8
5	Explain observations of how sound travels using the idea of a longitudinal wave		1 2 3 4 5 6 7 8
6	Describe the link between loudness and amplitude, using diagrams		1 2 3 4 5 6 7 8
7	Explain what happens when sound goes through matter or hits a boundary		1 2 3 4 5 6 7 8
8	Explain how you can make measurements of the amplitude of a sound wave		1 2 3 4 5 6 7 8
9	Compare and contrast waves of different loudness using a diagram		1 2 3 4 5 6 7 8
10	Describe in detail the behaviour of sound as it travels in matter or hits a boundary		1 2 3 4 5 6 7 8

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	4.1.3 Frequency and pitch		
1	Define auditory range		1 2 3 4 5 6 7 8
2	State the difference between frequency and pitch		1 2 3 4 5 6 7 8
3	Label time period on a diagram of a sound wave on an oscilloscope		1 2 3 4 5 6 7 8
4	Describe the auditory range of humans		1 2 3 4 5 6 7 8
5	Describe the link between frequency and pitch		1 2 3 4 5 6 7 8
6	Describe how to find the frequency of a wave from an oscilloscope trace		1 2 3 4 5 6 7 8
7	Present a reasoned prediction using data of how sounds will be differently heard by different animals		1 2 3 4 5 6 7 8
8	Compare and contrast waves of different frequency using a diagram		1 2 3 4 5 6 7 8
9	Use an oscilloscope on a variety of settings of s/div to find the period and frequency of a sound wave		1 2 3 4 5 6 7 8

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	4.1.4 The ear and hearing		
1	Name some parts of the ear		1 2 3 4 5 6 7 8
2	State some ways that hearing can be damaged		1 2 3 4 5 6 7 8
3	Describe some risks of loud music		1 2 3 4 5 6 7 8
4	Describe how the ear works		1 2 3 4 5 6 7 8
5	Describe how your hearing can be damaged		1 2 3 4 5 6 7 8
6	Explain some risks of loud music		1 2 3 4 5 6 7 8
7	Evaluate the data behind a claim for a sound creation or blocking device, using the properties of sound waves		1 2 3 4 5 6 7 8
8	Suggest the effects of particular ear problems on a person's hearing		1 2 3 4 5 6 7 8
9	Explain, in detail, risks of hearing damage linked to sound level and time of exposure		1 2 3 4 5 6 7 8

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	4.2.1 Light		
1	Describe some ways that light interacts with materials		1 2 3 4 5 6 7 8
2	State the speed of light		1 2 3 4 5 6 7 8
3	State the positions of the Earth, Moon, and Sun during a solar eclipse		1 2 3 4 5 6 7 8
4	Describe what happens when light interacts with materials		1 2 3 4 5 6 7 8
5	Explain how ray diagrams can explain the formation of shadows		1 2 3 4 5 6 7 8
6	Use ray diagrams to describe what observers see during an eclipse		1 2 3 4 5 6 7 8
7	Predict how light will interact with different materials		1 2 3 4 5 6 7 8
8	Use ray diagrams to explain what observers see during an eclipse		1 2 3 4 5 6 7 8

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	4.2.2 Reflection		
1	With guidance, construct ray diagrams to show how light reflects off mirrors and forms images		1 2 3 4 5 6 7 8
2	Identify examples of specular and diffuse reflection		1 2 3 4 5 6 7 8
3	Use appropriate equipment safely with guidance		1 2 3 4 5 6 7 8
4	Explain how images are formed in a plane mirror using a ray diagram		1 2 3 4 5 6 7 8
5	Explain the difference between specular and diffuse reflection		1 2 3 4 5 6 7 8
6	Use appropriate equipment and take readings safely without help		1 2 3 4 5 6 7 8
7	Use a ray diagram to explain how an image in a mirror changes as you move the mirror/object, or to explain the formation of images in multiple mirrors		1 2 3 4 5 6 7 8
8	Predict how light will reflect from different types of surface		1 2 3 4 5 6 7 8
9	Take accurate readings using appropriate equipment and working safely		1 2 3 4 5 6 7 8

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	4.2.3 Refraction		
1	Describe what happens when light is refracted		1 2 3 4 5 6 7 8
2	State a difference between what happens to light when it goes through a convex lens and a concave lens		1 2 3 4 5 6 7 8
3	Record some observations as a diagram with help		1 2 3 4 5 6 7 8
4	Use a ray diagram to describe how light travels through a transparent block		1 2 3 4 5 6 7 8
5	Use a ray diagram to describe what happens when light travels through a convex or concave lens		1 2 3 4 5 6 7 8
6	Record observations using a labelled diagram		1 2 3 4 5 6 7 8
7	Predict whether light will refract when it hits a surface		1 2 3 4 5 6 7 8
8	Draw ray diagrams to show what happens when light goes through a convex or concave lens		1 2 3 4 5 6 7 8
9	Record observations using labelled diagrams, and apply this to other situations		1 2 3 4 5 6 7 8

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	4.2.4 The eye and vision		
1	Name parts of the eye		1 2 3 4 5 6 7 8
2	Name two problems that people can have with their vision		1 2 3 4 5 6 7 8
3	Describe problems people have with their eyesight		1 2 3 4 5 6 7 8
4	Describe how the eye works		1 2 3 4 5 6 7 8
5	Name the lens used to correct short sight, and the lens used to correct long sight		1 2 3 4 5 6 7 8
6	Describe how lenses correct short-sight and long-sight		1 2 3 4 5 6 7 8
7	Explain how the eye forms an image		1 2 3 4 5 6 7 8
8	Explain how lenses correct vision		1 2 3 4 5 6 7 8
9	Use ideas about refraction to explain the action of lenses in glasses and contact lenses		1 2 3 4 5 6 7 8

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	4.2.5 Colour		
1	State what happens to light when it passes through a prism		1 2 3 4 5 6 7 8
2	State the difference between colours of light in terms of frequency		1 2 3 4 5 6 7 8
3	State the effect of coloured filters on light		1 2 3 4 5 6 7 8
4	Predict how red light will appear on a white surface		1 2 3 4 5 6 7 8
5	Explain what happens when light passes through a prism		1 2 3 4 5 6 7 8
6	Describe how primary colours add to make secondary colours		1 2 3 4 5 6 7 8
7	Explain how filters and coloured materials subtract light		1 2 3 4 5 6 7 8
8	Predict the colour of objects in red light and the colour of light through different filters		1 2 3 4 5 6 7 8
9	Explain why a prism forms a spectrum		1 2 3 4 5 6 7 8
10	Explain the formation of secondary colours		1 2 3 4 5 6 7 8
11	Predict how coloured objects will appear given different coloured lights and filters		1 2 3 4 5 6 7 8
12	Predict the colour of objects in lights of secondary colours, giving a reason for the prediction		1 2 3 4 5 6 7 8