

KS3 Learning checklist Physics

Level 4

- I can use words like kinetic, potential and chemical in my explanations.
- I can give examples of how energy goes to waste.
- I can describe the energy transfers in some devices.
- I know that fuels release energy when they are burnt.
- I can give some examples of how to save fuels.
- I can build some simple circuits and draw them using circuit diagrams.
- I can use the terms current, voltage and resistance in my explanations.
- I know how to measure the current in a circuit.
- I know the effect on the brightness of bulbs of connecting them in series.
- I can build series circuits and draw them as circuit diagrams.
- I know how current flows in series and parallel circuits.
- I know what type of fuels are used in power stations.
- I can classify some renewable and non-renewable resources
- I can give some examples of common temperatures on the Celsius scale.
- I know that sounds are made by vibrating objects.
- I know that sound becomes fainter further away from the source because energy dissipates or spreads out.
- I know that sounds travel at different speeds in solids, liquids and gases.
- I can explain how shadows form.
- I know that light travels much faster than sound.
- I can describe how light is reflected at plane (flat) surfaces.
- I know that filters and coloured objects absorb some colours (and transmit or reflect others).
- I know that light travels from light sources to our eyes so we can see them.
- I can measure the size of a force and use the right units.
- I can identify some different forces and describe how forces change movement.
- I can explain the link between the speed of an object and the forces on it.
- I can describe how forces change an object's shape, speed or direction.
- I know how to measure distance and time and what units to use.
- I know that friction is a force that opposes movement.
- I know that upthrust pushes upwards and weight pulls downwards.
- I can compare the speeds of different things and give some examples of streamlined objects.
- I know what can increase friction, air resistance and water resistance.
- I know that the Earth has a magnetic field around it.
- I can measure the size of a force and use the right units.
- I can compare the speeds of different things.
- I can describe what speed means scientifically and use the correct units.
- I can use the relationship between speed, distance and time

Level 5

- I know that energy can be stored in various forms.
- I can draw circuit diagrams of parallel circuits.
- I know how to measure the voltage in a circuit.
- I can link the number of cells in a circuit to energy transfers in circuits
- I can describe how electricity is generated using fuels and describe some of the possible environmental effects.
- I can describe how renewable energy resources can be used to generate electricity and provide heating.
- I can describe how insulators can reduce heat loss.

I can describe conduction, convection and radiation
I know how to calculate the speed of sound.
I know what an echo is and I can explain what causes it.
I can explain **two** ways of changing the size of a shadow.
I can describe how light is refracted at plane (flat) surfaces.
I can describe how curved mirrors work.
I can describe how a prism affects white light.
I can describe what effect coloured filters and coloured light have on coloured objects.
I know that we see objects' reflected light.
I can give **two** examples of how colour is useful in everyday life.
I know the main parts of the eye and can label them on a diagram.
I can identify the forces acting on an object and say which direction they are acting in.
I can describe situations where forces are balanced or unbalanced.
I know that if the forces on an object are unbalanced, it will either change shape or speed.
I can draw and use force diagrams with arrows to show the direction a force is acting in.
I can describe what speed means scientifically and use the correct units.
I can describe places where friction is useful and some ways of reducing it where it resists motion.
I know that air resistance is the force of friction of air on objects moving through it.
I can describe how streamlining reduces air and water resistance.
I can describe the shape and direction of a magnetic field.
I can explain how magnetic materials can be magnetised using a simple domain model.
I know how to increase the strength of an electromagnet.
I know some key facts about pressure.
I can describe how to lower pressure by spreading a force out over a larger area and how to increase pressure by concentrating a force.
I know that if the forces on an object are balanced, then it moves at a constant speed.

Level 6

I can explain a variety of energy transfers.
I can use a model to show energy conservation (e.g. Sankey diagram).
I can describe the current in a parallel circuit.
I understand the effect on the current of connecting bulbs in parallel.
I know that the voltage change across part of a circuit is a measure of its energy transfer.
I can compare the advantages and disadvantages of a range of energy resources.
I can describe how temperature difference leads to a flow of energy.
I can use the particle model to explain conduction and convection
I know the difference between a compression and rarefaction.
I can give some uses of an ultrasound
I can demonstrate the Law of reflection at plane (flat) surfaces.
I can describe total internal reflection.
I can recognise refraction and dispersion and I can give examples of each.
I can explain how the eye works.
I know that if an object's speed changes then the forces acting on it must be unbalanced.
I know that if the forces on an object are balanced then it moves at a constant speed.
I can use the relationship between speed, distance and time.
I can describe how air and water resistance change with speed and begin to link these ideas to the particle model.
I know about the forces on falling objects.
I can describe some of the effects of the Earth's magnetic field.
I can describe methods to demagnetise magnetic materials.

- I can describe the shape of the field around an electromagnet
- I can describe how pressure works in gases.
- I can explain how hydraulic machines work.
- I can describe how to balance a see-saw.
- I can describe what happens to the turning effect of a force using a longer lever.
- I understand the idea of moments to explain how things balance.

Level 7

- I can explain some of the problems associated with burning fossil fuels to generate electricity.
- I can describe how the current in various parts of a parallel circuit is affected by the resistance of the components.
- I can apply different models of voltage and energy changes to a circuit.
- I can describe some of the issues associated with using nuclear power
- I can use my ideas about heat transfer to explain the use of conductors and insulators in a range of situations.
- I can use my ideas about energy to explain heat transfer by radiation.
- I can use a model ear to describe some possible causes of hearing impairment.
- I know how convex lenses and concave lenses work.
- I can explain why coloured objects look different in coloured lights.
- I know that how much light refracts depends on its colour.
- I can use the particle model to explain scientifically why air and water resistance increase with speed.
- I can suggest reasons why the Earth's magnetic field may not be constant over time.
- I know that magnetic effects are used in electric motors and generators.
- I can calculate pressure using the equation. $P=F/A$
- I can use the relationship between pressure, force and area in different situations.
- I can apply the principle of moments to explain situations.
- I know that if an object's speed changes, then the forces acting on it must be unbalanced.
- I know what acceleration is.
- I can draw distance–time graphs and interpret them correctly.
- I can use the equation for speed in calculations and I can convert different units.
- I can explain how turning forces are used in levers

Level 8

- I can explain the advantages and disadvantages of using fossil fuels to generate electricity.
- I can explain, using the idea of energy transfer, the effect of adding more components to a circuit.
- I can explain the relationship between voltage and energy transfer.
- I can describe some of the social, economic and environmental issues arising from our continued reliance on fossil fuels.
- I can describe some of the issues associated with using nuclear power.
- I can explain using ideas about energy transfer, the dissipation of heat and sound during transfer processes.
- I can describe the different parts of the electromagnetic spectrum.
- I can explain how unbalanced forces cause an object to accelerate.
- I can calculate speed, distance or time from the other two measurements and identify the correct units.
- I can relate ideas and understanding about forces to situations in society, such as detecting drivers' braking speed limits.
- I can explain the relationship between the forces on a falling object.
- I can explain, with reference to the particle model, what causes air and water resistance