

Comparison of the Cambridge curriculum and Vividbooks content

100%

of the topics in the Cambridge lower secondary Physics curriculum covered.

We will cover the rest of your country's curriculum soon but you can still use Vividbooks content now to teach most topics! For curriculum alignment details see the following pages.

Curriculum Cambridge Physics

Vividbooks Content

Stage	Topic	In which book you can find it
7	Forces and Motion	Forces
	Energy	Energy
	The Earth and Beyond	To be done in 2021
8	Forces and Motion	The Basics
	Sound	To be done in 2021
	Light	Optics
	Magnetism	To be done in 2021
9	Forces and Motion	Forces
		The Basics
		Liquids and Gases
	Electricity	Electricity and Magnetism
	Energy	Energy

Chemistry and Biology ————— To be done in 2022

Stage 7 — Physics

Forces and Motion

Book: Forces

Chapters: Force and its expressions
Newton's lawLesson
ID

7Pf1 Describe the effects of forces on motion, including friction and air resistance.

Friction and frictional force	371
The magnitude of frictional force	419
The law of mutual interaction of forces 3	365
The law of power	317
Galileo's experiment	302
Jumping in space	77
The law of mutual interaction of forces 1	74
The law of inertia 2	71
The law of mutual interaction of forces 2	68
The law of inertia 1	65

Chapters: Centre of Gravity,
Force and its expressions

7Pf2 Describe the effect of gravity on objects. Secondary sources can be used.

The centre of gravity of the human body	503
Centre of gravity 2	485
The toy	461
Center of gravity	377
Weightlessness	416
Force of gravity	410
Weight and gravitational force	407
Gravitational force	401

Energy

Book: Energy

Chapter: Mechanical energy

7Pe1 Understand that energy cannot be created or destroyed and that energy is always conserved.

The law of conservation of energy	311
Energy	206

7Pe2 Recognise different energy types and energy transfers.

The law of conservation of energy	311
Energy	206
Losses of mechanical energy	233
Conversions of mechanical energy	227

Stage 7 — Physics

The Earth and Beyond

To be done in 2021

7Pb1 Describe how the movement of the Earth causes the apparent daily and annual movement of the sun and the stars.

—

7Pb2 Describe the relative position and movement of the planets and the sun in the solar system.

—

7Pb3 Discuss the impact of the ideas and discoveries of Copernicus, Galileo and more recent scientists.

—

7Pb4 Understand that the sun and other stars are sources of light and that planets and other bodies are seen by reflected light.

—

Stage 8 — Physics

Forces and Motion

Book: The Basics

Chapter: Movement

Lesson
ID

8Pf1 Calculate average speeds through the use of timing gates.

Speed
Speed, distance, time440
431

8Pf2 Interpret simple distance/time graphs.

Average and current speed

422

Sound

To be done in 2021

8Ps1 Explain the properties of sound in terms of movement of air particles.

—

8Ps2 Recognise the links between loudness and amplitude, pitch and frequency, using an oscilloscope.

—

Light

Book: Optics

Chapter: Creation and spread of light

8PI1 Use light travelling in a straight line to explain the formation of shadows and other phenomena.

Shadows and penumbra
Propagation of light
Optical environments155
152
149

Chapter: Reflection of light

8PI2 Describe how non-luminous objects are seen.

Reflection of light

158

8PI3 Describe reflection at a plane surface and use the law of reflection.

How mirrors work
Reflection of light161
158

Chapter: Refraction of light and image capturing

8PI4 Investigate refraction at the boundary between air and glass or air and water.

How light is refracted?
Light refraction350
173

Stage 8 — Physics

Light

Book: Optics

Chapter: Colours

Lesson
ID

8PI5 Explain the dispersion of white light.

Dispersion of white light

197

8PI6 Explain colour addition and subtraction, and the absorption and reflection of coloured light.

RGB colour composition
The colour of objects
CMYK203
200
725

Magnetism

To be done in 2021

8Pm1 Describe the properties of magnets.

—

8Pm2 Recognise and reproduce the magnetic field pattern of a bar magnet.

—

8Pm3 Construct and use an electromagnet

—

Stage 9 — Physics

Forces and Motion

Book: Forces

Chapters: Force and its expressions

Lesson
ID

9Pf1 Explain that pressure is caused by the action of a force on an area.

Pressure and compressive force 2
Pressure and compressive force 1380
368

Book: The basics

Chapters: Mass, Physical quantities

9Pf2 Determine densities of solids, liquids and gases.

The structure of materials
Density
Density of matter728
686
707

Book: Liquids and gases

Chapters: Mechanical properties of liquids, Mechanical properties of gasses

9Pf3 Explain pressures in gases and liquids (qualitative only).

Pascal's experiment 119
Pascal's law 110
Why water is buoyant 59
Hydrostatic compressive force 56
Hydrostatic pressure 29
Overpressure and underpressure 338
Experiments with a vacuum pump 320
The atmosphere 146
Pumping 143
How pumps work 140
How straws work 137
Effects of atmospheric compressive force 134
Buoyant force in the atmosphere 131

Book: Forces

Chapters: Rotational forces

9Pf4 Know that forces can cause objects to turn on a pivot and understand the principle of moments.

Turning effect of forces 524
Moment of force 521
The decimal balance 518
The pulley 500
Balance on the lever 437
The lever 425
Block and tackle 2 95
Block and tackle 1 92
Fixed and moveable pulleys 80

Stage 9 — Physics

Electricity

Book: Electricity and Magnetism

Chapters: Electric circuits, Basic electrical quantities

Lesson ID

9Pm1 Describe electrostatics and the concept of charge, including digital sensors.

Electric charge
How to disturb an atom737
923

Chapter: Electric circuits

9Pm2 Interpret and draw simple parallel circuits.

Serial and parallel connections
Parallel connection of resistors785
800

9Pm3 Model and explain how common types of components, including cells (batteries), affect current.

Resistors
Simple electrical circuits
Rheostats
Ohm's law752
761
803
812

9Pm4 Explain how current divides in parallel circuits.

Parallel connection of resistors

800

9Pm5 Measure current using ammeters and voltage using voltmeters, including digital meters.

Measuring voltage and current

815

Energy

Book: Energy

Chapter: Electric power plants

9Pe1 Use knowledge of energy sources including fossil fuels and renewable energy resources to consider the world's energy needs, including research from secondary sources.

Nuclear power plants
Coal formation
Coal power plants
Hydroelectric power plants
Solar and wind power plants344
296
290
287
284

Chapter: Thermal Physics

9Pe2 Identify and explain the thermal (heat) energy transfer processes of conduction, convection and radiation.

Heat exchange
Thermal insulation
Heat transfer by radiation
Coolers
Heat transfer by convection
Heat transfer by conduction
Heat exchange
Internal energy491
341
254
251
248
245
242
239

Curriculum Cambridge

Vividbooks Content

Stage 9 — Physics

Energy

Book: Energy

Chapter: Change of state

Lesson ID

9Pe3 Explain cooling by evaporation.

Latent heat of vaporisation
Evaporation
Sauna

335
332
323

Curriculum Cambridge

Vividbooks Content

Stage 7 — Biology

Plants

To be done in 2022

7Bp1 Recognise the positions, and know the functions of the major organs of flowering plants, e.g. root, stem, leaf.

—

Humans and organisms

To be done in 2022

7Bh1 Explore the role of the skeleton and joints and the principle of antagonistic muscles.

—

7Bh2 Recognise the positions and know the functions of the major organ systems of the human body. Secondary sources can be used.

—

7Bh3 Research the work of scientists studying the human body.

—

Cells and organisms

To be done in 2022

7Bc1 Identify the seven characteristics of living things and relate these to a wide range of organisms in the local and wider environment.

—

7Bc2 Know about the role of micro-organisms in the breakdown of organic matter, food production and disease, including the work of Louis Pasteur.

—

Curriculum Cambridge

Vividbooks Content

7Bc3 Identify the structures present in plant and animal cells as seen with a simple light microscope and/or a computer microscope.

—

7Bc4 Compare the structure of plant and animal cells.

—

7Bc5 Relate the structure of some common cells to their functions. Secondary sources can be used.

—

7Bc6 Understand that cells can be grouped together to form tissues, organs and organisms.

—

Living things in their environment

To be done in 2022

7Be1 Describe how organisms are adapted to their habitat, drawing on locally occurring examples. Secondary sources can be used.

—

7Be2 Draw and model simple food chains.

—

7Be3 Discuss positive and negative influence of humans on the environment, e.g. the effect on food chains, pollution and ozone depletion.

—

7Be4 Discuss a range of energy sources and distinguish between renewable and non-renewable resources. Secondary sources can be used.

—

Variation and classification

To be done in 2022

7Bv1 Understand what is meant by a species.

—

7Bv2 Investigate variation within a species. Secondary sources can be used.

—

7Bv3 Classify animals and plants into major groups, using some locally occurring examples.

—

Stage 7 — Chemistry

States of matter

To be done in 2022

7Cs1 Show in outline how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state.

—

Material properties

To be done in 2022

7Cp1 Distinguish between metals and non-metals.

—

7Cp2 Describe everyday materials and their physical properties.

—

Material changes

To be done in 2022

7Cc1 Use a pH scale.

—

7Cc2 Understand neutralisation and some of its applications.

—

7Cc3 Use indicators to distinguish acid and alkaline solutions.

—

The Earth

To be done in 2022

7Ce1 Observe and classify different types of rocks and soils.

—

7Ce2 Research simple models of the internal structure of the Earth.

—

7Ce3 Examine fossils and research the fossil record.

—

7Ce4 Discuss the fossil record as a guide to estimating the age of the Earth.

—

Curriculum Cambridge

Vividbooks Content

7Ce5 Learn about most recent estimates of the age of the Earth.

—

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Vividbooks Content

Stage 8 — Biology

Plants

To be done in 2022

8Bp1 Explore how plants need carbon dioxide, water and light for photosynthesis in order to make biomass and oxygen.

—

8Bp2 Describe the absorption and transport of water and mineral salts in flowering plants.

—

Humans and organisms

To be done in 2022

8Bh1 Identify the constituents of a balanced diet and the functions of various nutrients. Secondary sources can be used.

—

8Bh2 Understand the effects of nutritional deficiencies.

—

8Bh3 Recognise the organs of the alimentary canal and know their functions. Secondary sources can be used.

—

8Bh4 Understand the function of enzymes as biological catalysts in breaking down food to simple chemicals.

—

8Bh5 Recognise and model the basic components of the circulatory system and know their functions.

—

8Bh6 Understand the relationship between diet and fitness.

—

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8Bh7 Discuss how conception, growth, development, behaviour and health can be affected by diet, drugs and disease.

—

8Bh8 Recognise the basic components of the respiratory system and know their functions.

—

8Bh9 Define and describe aerobic respiration, and use the word equation.

—

8Bh10 Explain gaseous exchange.

—

8Bh11 Describe the effects of smoking.
Secondary sources can be used.

—

8Bh12 Discuss the physical and emotional changes that take place during adolescence.

—

8Bh13 Describe the human reproductive system, including the menstrual cycle, fertilisation and foetal development.

—

Stage 8 — Chemistry

States of matter

To be done in 2022

8Cs1 Show how the particle theory of matter can be used to explain the properties of solids, liquids and gases, including changes of state, gas pressure and diffusion.

—

Material properties

To be done in 2022

8Cp1 Describe and explain the differences between metals and nonmetals.

—

8Cp2 Give chemical symbols for the first twenty elements of the Periodic Table.

—

8Cp3 Understand that elements are made of atoms.

—

8Cp4 Explain the idea of compounds.

—

8Cp5 Name some common compounds including oxides, hydroxides, chlorides, sulfates and carbonates.

—

8Cp6 Distinguish between elements, compounds and mixtures.

—

Material changes

To be done in 2022

8Cc1 Use a word equation to describe a common reaction. Secondary sources can be used.

—

8Cc2 Describe chemical reactions which are not useful, e.g. rusting.

—

Stage 9 — Biology

Plants

To be done in 2022

9Bp1 Define and describe photosynthesis, and use the word equation.

—

9Bp2 Understand the importance of water and mineral salts to plant growth.

—

9Bp3 Understand sexual reproduction in flowering plants, including pollination, fertilisation, seed formation and dispersal.

—

Living things in their environment

To be done in 2022

9Be1 Explain the ways in which living things are adapted to their habitats. Secondary sources can be used.

—

9Be2 Research the work of scientists studying the natural world. Secondary sources can be used.

—

9Be3 Explain and model food chains, food webs and energy flow.

—

9Be4 Explain the role of decomposers.

—

9Be5 Describe factors affecting the size of populations.

—

9Be6 Describe and investigate some effects of human influences on the environment.

—

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Stage 9 — Biology

Variation of classification

To be done in 2022

9Bv1 Use and construct keys to identify plants and animals.

—

9Bv2 Understand that organisms inherit characteristics from their parents through genetic material that is carried in cell nuclei.

—

9Bv3 Describe how selective breeding can lead to new varieties.

—

9Bv4 Discuss the work of Darwin in developing the scientific theory of natural selection.

—

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Stage 9 — Chemistry

Material properties

To be done in 2022

9Cp1 Describe the structure of an atom and learn about the methods and discoveries of Rutherford.

—

9Cp2 Compare the structures of the first twenty elements of the Periodic Table.

—

9Cp3 Describe trends in groups and periods.

—

9Cp4 Talk about the contribution of scientists. Secondary sources can be used.

—

Curriculum Cambridge

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9Cc1 Explore and explain the idea of endothermic processes, e.g. melting of ice, and exothermic reactions, e. g. burning, oxidation.

—

9Cc2 Describe the reactivity of metals with oxygen, water and dilute acids.

—

9Cc3 Explore and understand the reactivity series.

—

9Cc4 Give examples of displacement reactions.

—

9Cc5 Explain how to prepare some common salts by the reactions of metals and metal carbonates and be able to write word equations for these reactions.

—

9Cc6 Give an explanation of the effects of concentration, particle size, temperature and catalysts on the rate of a reaction.

—