

LONG TERM PLAN

SCIENCE

KS3

Year 7 - Year 8 - Year 9

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SCIENCE DEPARTMENT KS3

Subject intent/vision:

Eastlea's Science Curriculum strives for exceptional student progress, fostering critical thinking, problem-solving, innovation, and teamwork for success beyond the classroom.

To enable all students to achieve, our subject curriculum is underpinned by the following principles:



Ambitious – all students will study a three-year KS3 curriculum that interlinks with our KS4 science curriculum. This will enable all students to sit the GCSE exam in science at the end of year 11. Top set students will sit the Triple science exam in year 11.



Sequenced / Spiral – our Science lessons at Eastlea begin with Do Now activities to reinforce previous learning and aid memory retention, with some topics revisited over the years for knowledge building. Additionally, our personalised homework system aligns with class learning to reinforce retrieval of prior knowledge.



Literacy – In every science lesson, we conscientiously impart tier 2/3 vocabulary to our students through explicit instruction, supplemented by choral practice sessions. Additionally, teachers meticulously define key terminology, providing relatable examples to facilitate students' comprehension of abstract concepts.



Cultural Capital – Eastlea's Science curriculum enriches students' Cultural Capital by covering key concepts like scientific method, data analysis, and ecosystem dynamics, while hands-on activities foster practical application and nurture problem-solving and critical thinking skills essential for success in science and beyond.

KEY STAGE 2**KS2****Biology**

Plants, including parts of plants, needs of plants and their life cycle.

Animals, including humans, focus on nutrition, skeletons and muscles. Living things and their habitats, including classifying living things and looking at changes to environments.

Animals, including humans, focus on eating: teeth, the digestive system and food chains.

Chemistry

Rocks, including comparing rocks, looking at fossils and understanding how soil is made.

Properties and changes of materials, including dissolving, separating and reversible changes.

Physics

Light, looking at how light is reflected, how shadows are formed and can change.

Forces and magnets, focusing on attraction and repulsion of magnets, magnetic materials and the two poles of a magnet.

TOPIC / FOCUS

YEAR 7

Working Scientifically

Biology

Chemistry

Physics

Autumn 1

Autumn 2

Spring 1

Spring 2

Summer 1

Summer 2

W.S1 Working Scientifically

- Asking scientific questions.
- Working safely.
- Planning investigation
- Recording data
- Presenting data.
- Analysing data
- Evaluating data.

B1 Cells

- Introduction to the building blocks of life(cells)

Matter

- C1.1 Particles and behaviour

P1 Forces 1.1:

- 1.1 Introduction to forces
- 1.2 Squashing and stretching
- 1.3 Drag forces and friction.
- 1.4 Forces at a distance
- 1.5 Balanced and unbalanced forces, 1 Forces

B1,2 Structure and function of body system

- 2.1 Levels of organisation
- 2.2 Gas exchange
- 2.3 Breathing
- 2.4 Skeleton
- 2.5 Movement: joints
- 2.6 Movement: muscles

C1.2 Elements, atoms and compounds

- 2.1 Elements
- 2.2 Atoms
- 2.3 Compounds
- 2.4 Chemical formulae

P1.2 Sound Waves

- 2.1 Sound
- 2.2 Loudness and pitch
- 2.3 Detecting sound.
- Echoes and ultrasound

C1.3 Reactions

- 3.1 Chemical reactions
- 3.2 Word equations
- 3.3 Oxidation reactions
- 3.4 Decomposition reactions
- 3.5 Using ratios.
- 3.6 Conservation of mass
- 3.7 Exothermic and endothermic reactions

B1.3 Reproduction

- 3.1 Adolescence
- 3.2 Reproductive systems
- 3.3 Fertilisation and implantation
- 3.4 Development of a foetus
- 3.5 The menstrual cycle
- 3.6 Flowers and pollination
- 3.7 Fertilisation and germination
- 3.8 Seed dispersal

P1.3 Light

- Light
- Reflection
- Refraction
- The eye and the camera
- Colour

C1.4 Acids and alkalis

- 4.1 Acids and alkalis
- 4.2 Indicators and pH
- 4.3 Neutralisation
- 4.4 Making salts

P1.4 Space:

- 4.1 The night sky
- 4.2 The Solar System
- 4.3 The Earth
- 4.4 The Moon
- B1.1/B1.2/B1.3 Revisions
- C1.1/C1.2/C1.3/C1.4 Revisions
- P1.1/P1.2/P1.3/P1.4 Revisions

Resources	Resources	Resources	Resources	Resources	Resources
Introduction to science workbook. Sustainability project Activate 1 textbook, practical equipment	Activate 1 textbook, practical equipment,	Activate 1 textbook, practical equipment,	Activate 1 textbook, practical equipment,	Activate 1 textbook, practical equipment,	Activate 1 textbook, practical equipment,
Assessment	Assessment	Assessment	Assessment	Assessment	Assessment
At the end of every unit that varies from 2-3 weeks:	At the end of every unit that varies from 2-3 weeks:	At the end of every unit that varies from 2-3 weeks:	At the end of every unit that varies from 2-3 weeks:	At the end of every unit that varies from 2-3 weeks:	At the end of every unit that varies from 2-3 weeks:
• B1 cells, • C1 Matter • Exam question practise • Extended writing • Assessment Objectives	• P1 Forces • B1.2 Structure and function of body system • Exam question practise • Extended writing • Assessment Objectives	• C1.2 Elements, atoms • P1.2 Sound waves • Exam question practise • Extended writing • Assessment Objectives	• C1.3 Reactions; • B1.3 Reproduction • Exam question practise • Extended writing	• P1.3 Light • C1.4 Acids, alkalis • Exam question practise • Extended writing	• P1.3 Light • C1.4 Acids, alkalis • Exam question practise • Extended writing
Extended Learning Opportunities	Extended Learning Opportunities	Extended Learning Opportunities	Extended Learning Opportunities	Extended Learning Opportunities	Extended Learning Opportunities
Survival Island project Stem club (after school enrichment program). Science Quiz Club (TBC)	Centre of the cell visit	Visit the 'Who am I'? exhibition at the Science Museum	Visit the 'Who am I'? exhibition at the Science Museum	Floating Garden Project Visit Whipsnade zoo or London zoo	Science Museum
Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)
Investigate variables on the speed of a toy car rolling down a slope Explain the way in which an astronaut's weight varies on a journey to the moon	Use models to investigate the relationship between the properties of a material and the arrangement of its particles Explore how the skeletal system and muscular system in a chicken wing work together to cause movement	Graph data relating to variation and explain how it may lead to the survival of a species Relate advice to pregnant women to ideas about transfer of substances to the embryo	Model the processes that are responsible for rock formation and link these to the rock features Relate observations of changing day length to an appropriate model of the solar system	Devise an enquiry to compare how well indigestion remedies work Use experimental results to suggest an order of reactivity of various Metals	Relate changes in the shape of an oscilloscope trace to changes in pitch and volume Use ray diagrams to model how light passes through lenses and transparent materials

TOPIC / FOCUS

YEAR 8

Working Scientifically

Biology

Chemistry

Physics

Autumn 1

WS2 Working Scientifically

- Planning
- investigations 2
- Presenting data 2
- Analysing and evaluating data 2
- Communicating Scientific Information
- Using evidence and sources
- Development of Scientific Understanding

B2.4 Inheritance

- B2,4.1 Variation
- B2,4.2
- Continuous and discontinuous
- B2,4.3
- Inheritance
- B2,4.4 Natural selection
- B2,4.5 Extinction
- Big Question WebQuest
- Metacognition lessons
- Cross-curricular project

Autumn 2

C2,2 Separation technique

- C2,2.1 Pure substances
- C 2,2.2 Mixtures
- C2,23 Solutions
- C2,24 Solubility
- C2,25 Filtration
- Evaporation and distillation
- C2,26
- Chromatography

P2,3 Motion and pressure.

- P2,3.1 Speed
- P2,3.2 Motion graphs
- P2,3.3 Pressure in gases
- P2,3.4 Pressure in liquids
- P2,3.5 pressure on solids
- P2,3.6 Turning forces
- Revision and summative test
- Feedback lesson and cross-curricular project

Spring 1

B2,2 Biological processes

- B2,2.1 Photosynthesis
- B2, 2.2 Leaves
- B2,2.3 Plant minerals
- B2,2.4 Aerobic respiration
- B2,2.5 Anaerobic respiration

C2,1 The periodic table

- C2,1.1 Three elements
- C2,1.2 Physical properties of metals and non-metals
- C2,1.3 Chemical properties of metals and non-metals
- C2,1.4 Groups and periods
- C2,1.5 The elements of group 1
- C2,1.6 The elements of group 7
- C2,1.7 The elements of group 0
- Revision and summative test

Spring 2

P2,2 Energy

- P2,2.1 Food and fuels
- P2,2.2 Energy resources
- P2,2.3 Energy adds up
- P2,2.4 Energy and temperature
- P2,2.5 Energy transfer: particles
- P2,2.6 Energy transfer: radiation
- P2,2.7 Energy transfer: forces
- P2,2.8 Energy and power

C2,3 Metals and other materials

- C2,3.1 Metals and acids
- C2,3.2 Metals and oxygen
- C2,3.3 The reactivity series
- C2,3.4 Metal displacement reactions
- C2,3.5 Extracting metals
- C2,3.6 Ceramics
- C2,3.7 Polymers
- C2,3.8 Composites
- Revision lessons and summative test
- Feedback lessons and cross-curricular project

Summer 1

B2,1 Health and lifestyle

- B2,1.1 Nutrients
- B2,1.2 Food tests
- B2,1.3 Unhealthy diet
- B2,1.4 Digestive system
- B2,1.5 Bacteria and enzymes in digestion
- B2,1.6 Drugs
- B2,1.7 Alcohol
- B2,1.8 Smoking

P2.1 Electricity and magnets

- P2,1.1 Charging up
- P2,1.2 Circuits and current
- P2,1.3 Potential difference
- P2,1.4 Resistance
- P2,1.5 Changing the subject
- P2,1.6 Series and parallel
- P2,1.7 Magnets and magnetic fields
- P2,1.8 Electromagnets
- P2,1.9 Using electromagnets
- Revision and summative assessment Feedback lesson Cross-cultural

Summer 2

C2, 4 The Earth

- C2,4.1 The Earth and its atmosphere
- C2,4.2 Sedimentary rocks
- C2,4.3 Igneous and metamorphic rocks
- C2,4.4 The rock cycle
- C2,4.5 The carbon cycle
- C2,4.6 Global heating
- C2,4.7 Climate change
- C2,4.8 Recycling

B2, 3 Ecosystems and adaptation

- B2,3.1 Food chains and webs
- B2, 3.2 Disruption to food chains and webs
- B2,3.3 Ecosystems B2,3.4 Competition
- B2,3.5 Adapting to change
- Revision and end of year exams
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Resources Activate 2 textbook, practical equipment	Resources Activate 2 textbook, practical equipment	Resources Activate 2 textbook, practical equipment,	Resources Activate 1 & 2 textbook, practical equipment,	Resources Activate 2 textbook, practical equipment,	Resources Activate 2 textbook, practical equipment,
Assessment At the end of every unit that varies from 2-3 weeks: On WS2 Working Scientifically B2.4 Inheritance Exam question practise Extended writing	Assessment At the end of every unit that varies from 2-3 weeks: End of topic tests On C2.2 Separation techniques and P2.3 Pressure and motion Exam question practise Extended writing	Assessment At the end of every unit that varies from 2-3 weeks: End of topic tests on B2.2 Biological processes and C2.1 Periodic table Exam question practise Extended writing	Assessment At the end of every unit that varies from 2-3 weeks: End of topic tests On P2.2 Energy and C2.3 Metals and other materials Exam question practise Extended writing	Assessment At the end of every unit that varies from 2-3 weeks: End of topic tests On B2.2 Health and lifestyle and P2.1 Electricity and magnets Exam question practise Extended writing	Assessment At the end of every unit that varies from 2-3 weeks: End of topic tests C2.4 The Earth B2.3 Adaptation and ecosystems Exam question practise Extended writing
Extended Learning Opportunities STEM club, trips, Science week. Science Quiz Club (TBC)	Extended Learning Opportunities STEM club, trips, Science week. Science Quiz Club (TBC)	Extended Learning Opportunities STEM club, trips, Science week	Extended Learning Opportunities STEM club, · Visit the Atmosphere gallery at the Science Museum	Extended Learning Opportunities The Water Project (in cross-curricular folder)	Extended Learning Opportunities Floating Garden Project Science Week
Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)
Investigate a claim linking height to lung volume Evaluate how well a model represents key features of the digestive system Compare the properties of elements with the properties of a compound formed from them	Investigate factors that affect the size of frictional or drag forces Investigate how pressure from your foot onto the ground varies with different footwear Use data from investigating fermentation with yeast to explore respiration	Investigate changes in mass for chemical and physical processes Investigate a phenomenon that relies on an exothermic or endothermic reaction Relate the impact of different types of wave on living cells to their frequency	Investigate the contribution that natural and human chemical processes make to our carbon dioxide emissions Predict the method used for extracting a metal based on its position in the reactivity series	Explore the magnetic field pattern around different types or combinations of magnets Investigate ways of varying the strength of an electromagnet	

TOPIC / FOCUS

YEAR 9

Working Scientifically

Biology

Chemistry

Physics

Autumn 1

Autumn 2

Spring 1

Spring 2

Summer 1

Summer 2

B1 Cells and Transport

Big idea

organisms are organised on a cellular basis and have a finite life span

Key concept

cells are the fundamental structural, functional and biological unit of life.

B2 Cell Division

Cell division is the process in which one cell, called the parent cell, divides to form two new cells, referred to as daughter cells.

1.1 States of matter

Students should be able to identify the three states of matter: solid, liquid, and gas.

Students should be able to describe the characteristics of each

C1 Atomic Structure

Atoms are the fundamental building blocks of matter and are built from protons, neutrons and electrons. A useful way to approach the teaching of atomic structure is to consider the changing models proposed by scientists throughout history.

C2 The Periodic Table

Understanding how the elements are arranged and being able to explain trends down groups and across periods is incredibly satisfying and allows students to apply their chemical knowledge.

1.4 Waves

The nature of waves
The properties of waves
Electromagnetic waves

P1 Energy & dissipation of energy

Energy is undoubtedly a tricky concept for students to understand. Simple definitions, although useful in the short term, can prove problematic for students later on so perhaps are best avoided.

P2 Energy Transfer by Heating

Get students to reconsider their own ideas about hot and cold surfaces, temperature, conduction, energy transfer and insulation.

3.7 Lifestyle and health

Health and disease
Non-communicable diseases
Smoking and the risk of diseases
Diet, exercise and diseases
Alcohol and other carcinogens
Helping the heart

3.8 Radiation and risk

Atoms and radiation
Radioactivity
Nuclear changes
Half-life
Properties of radiation
Radiation hazards
Cancer

B3 Organisation and the Digestive System

It helps students understand digestion if they see the digestive system as one long (0.9 m) tube.

B4 Organising animals and Plant

How many organs and bones from the skeleton can your students name when looking at this MRI scan of a human? Does it show male or a female?

4.10 The Earth's atmosphere

History of the Earth's atmosphere
The Earth's evolving atmosphere
Material recycling
The carbon cycle
The greenhouse effect
Analysing the evidence
The impacts of climate change

B5: Communicable diseases

One of the main reasons bacteria are so successful is because they are small.

B6: Preventing and treating diseases

Students use a graph showing HIV number and wbc count to explain the difference between HIV and AIDS

5.13 The periodic table ii

Development of the periodic table
Electronic structures and the periodic table
Group 1- the alkali metals
Group 7- the halogens
Explaining trend

5.14 Chemical quantities

B7: Non-communicable diseases

Diseases can be grouped into two types: communicable and non-communicable.

P6: Molecules and matter

Molecules are tiny particles that make up all matter around us, like water, air, and even ourselves.

6.17 Magnetism and Electromagnetism

Magnetic fields
Electromagnetism
The motor effect(H)

6.15 Forces and energy changes

Vectors and scalars
Forces between objects
Resultant forces
Mass and weight

state of matter, such as the fact that solids have a fixed shape and size, while liquids and gases do not. C1 Atomic Structure Atoms are the fundamental building blocks of matter and are built from protons, neutrons and electrons.	Reflection and refraction(H) Light, infrared, microwaves, radio waves UV, X-rays, Gamma, X-rays in medicine 2.5 Systems in the human body Aerobic respiration Anaerobic respiration Exchanging materials Chemistry of food How the digestive system works Human nervous system Reflex actions Principles of hormonal control The role of negative feedback 2.6 Plants and photosynthesis Specialised plant cells Plant tissues and organs Meristems and plant cloning Evaporation and transpiration Factors affecting transpiration Photosynthesis The rate of photosynthesis Making the most of photosynthesis	3.9 Preventing, treating and curing disease Pathogens Preventing infections Viral diseases Bacterial diseases Human defence responses Vaccination Antibiotics and painkiller Testing new medical drug Genetic modification and medicine Stem cells in medicine Stem cells dilemma	Atmospheric pollutants The water cycle Potable water Treating wastewater 4.11 Ecosystems and biodiversity Organisation in ecosystems Feeding relationships Factors affecting communities Competition in animals and plants Field investigations Biodiversity Human factors affecting biodiversity Deforestation and peat destruction Land and water pollution Positive human impacts on ecosystem 4.12 Inheritance, variation, and evolution DNA and the genome Inheritance in action More about genetics Variation Evolution by natural selection Evolution in action Fossil evidence for evolution More evidence for evolution Classification systems Selective breeding Genetic engineering Ethics of genetic technologies	Atoms,elements and compounds Chemical equations Relative masses and moles Equations and calculations From masses to balanced equations Concentrations of solutions	The parallelogram of forces Resolution of forces Energy and work Gravitational potential energy stores
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Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics	Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics	Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics	Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics	Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics	Resources Textbook - Kerboodle AQA Biology/Chemistry/Physics
Assessment At the end of every unit that varies from 2-3 weeks: Exam pulse command words End of unit tests for B1 Cells and organisation B2 Cell division Discussion /Explanation. End of Autumn 1 Assessment -October	Assessment At the end of every unit that varies from 2-3 weeks: End of unit tests for C1 Atomic structure and C2 Periodic table Discussion /presentation. Extended writing End of Autumn 2 Assessment -December	Assessment At the end of every unit that varies from 2-3 weeks: End of units tests P1 Energy dissipation and P2 Energy transfer Discussion and conclusion Exam practice Research End of Spring 1 Assessment -February	Assessment At the end of every unit that varies from 2-3 weeks: End of units tests B3 Digestive System B4 Organising plants and organism Discussion and conclusion Exam practice Research End of Spring 2 Assessment -March	Assessment At the end of every unit that varies from 2-3 weeks: End of units tests B5: Communicable Diseases B6: Preventing and treating diseases Evaluation planning investigation Discussion and conclusion Exam practice End of Summer 1 Assessment -May	Assessment At the end of every unit that varies from 2-3 weeks: End of units tests on B7: Non- communicable diseases P6 Molecules and matter Discussion and conclusion Exam practice Research End of Summer 2 Assessment -June
Extended Learning Opportunities Making models of specialised cells.	Extended Learning Opportunities Research on the history of the periodic table	Extended Learning Opportunities Research and Presentation	Extended Learning Opportunities Exam practice Data analysis Presentation	Extended Learning Opportunities Exam practice Revision Data analysis	Extended Learning Opportunities Exam practice Revision Research Presentation

Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)	Working Scientifically: (Concepts)
WS 4.4 Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano). WS 1.2 Recognise, draw and interpret images of cells.	WS 4.4 Use prefixes and powers of ten for orders of magnitude (eg tera, giga, mega, kilo, centi, milli, micro and nano). WS 1.2 Recognise, draw and interpret images of cells.	WS 1.1, 1.6 To show an understanding of why and describe how scientific methods and theories develop over time.	WS 4.3 Use SI units (eg kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate..	WS 1.2 Students should be able to use other models to explain enzyme action WS 1.5 Evaluate risks related to use of blood products.	WS 1.2 Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts. Working Scientifically: (CONCEPTS) WS 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.