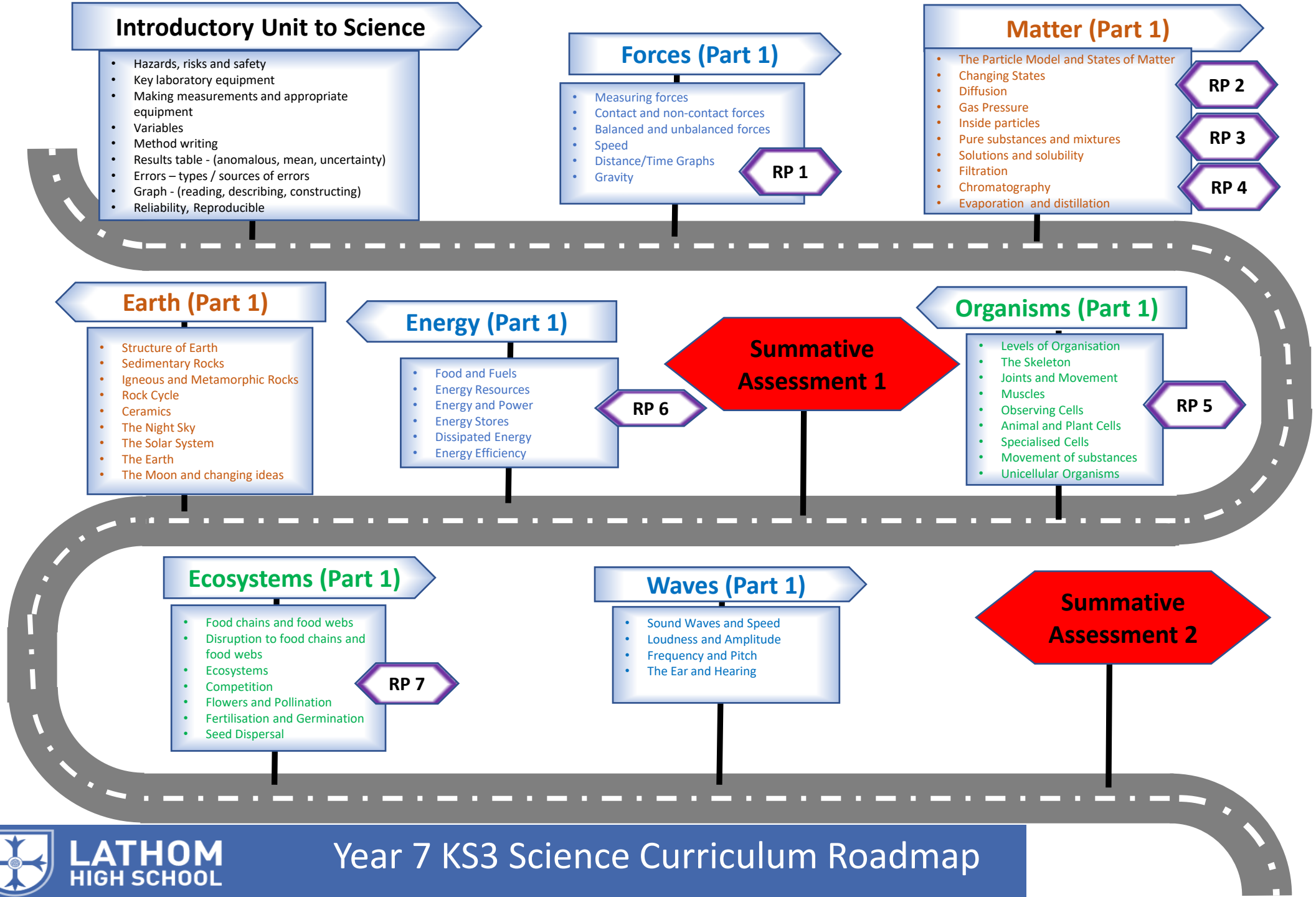

Required Practical

RP1 –Investigating the speed of objects
(Focus - Variables / method writing)

RP2 - Separating salt from rock salt
(Focus – method writing)

RP3 - Chromatography
(Focus - Planning / method writing)

RP4 - Distillation
(Focus - Analysis)

RP5 - Microscopy
(Focus - method writing)

RP6 - Energy content in food
(Focus - Obtaining evidence / evaluation)

RP7 - Investigating plant distribution
(Focus - Analysis)

LATHOM HIGH SCHOOL

Year 7 KS3 Science Curriculum Roadmap

Genes (Part 1)

- Variation
- Continuous & Discontinuous Variation.
- Adapting to Change
- Adolescence
- Human Reproductive System
- Fertilisation and Implantation
- Pregnancy and Birth
- The Menstrual Cycle

Reactions (Part 1)

- Chemical reactions
- Acids and Alkalis
- Indicators and pH
- Acid Strength
- Neutralisation
- Making Salts
- More about Elements
- Reactions of Metals and non-metals
- Displacement
- Metals and acids
- Metals and Oxygen

RP 1

Electromagnets (Part 1)

- Static Electricity
- Electric Current
- Potential Difference
- Series & Parallel Circuits
- Resistance in Circuits

RP 2

RP 3

Energy (Part 2)

- Work, Energy and Machines
- Energy and Temperature
- Energy Transfer: Conduction and Convection.
- Energy Transfer: Radiation and Insulation

RP 5

Genes (Part 2)

- Natural Selection
- Charles Darwin
- Extinction
- Preserving Biodiversity
- Inheritance
- DNA
- Genetics

Waves (Part 2)

- Water Waves and Energy
- Radiation and Energy
- Modelling Waves
- Transverse waves and properties
- Light
- Reflection and refraction
- Eye and vision
- Colour

Summative Assessment 1

Earth (Part 2)

- Global Warming
- The Carbon Cycle
- Climate Change
- Extracting Metals
- Recycling

RP 4

Matter (Part 2)

- Elements
- Atoms
- Compounds
- Chemical Formulae
- Polymers
- The Periodic Table
- Group 1 Elements
- Group 7 Elements
- Group 0 Elements

Electromagnets (Part 2)

- Magnets & Magnetic Fields
- Electromagnets
- Using Electromagnets

Ecosystems (Part 2)

- Aerobic Respiration
- Anaerobic Respiration
- Biotechnology
- Photosynthesis
- Leaves
- Investigating Photosynthesis
- Plant Minerals

RP 6

RP 7

Summative Assessment 2

Year 8 KS3 Science Curriculum Roadmap

LATHOM HIGH SCHOOL

Required Practical

RP1 - Reactions of metals with acids
(Focus - Variables and risk assessment)

RP2 - Series and parallel circuits
(Focus – Analysis)

RP3 - Resistance of a wire
(Focus - Analysis)

RP4 - Extraction of metals
(Focus – Risk assessment)

RP5 - Energy Transfer - Insulation
(Focus - Risk assessment / evaluation)

RP6 - Investigating the effects of exercise on breathing rates
(Focus - variables, analysis and evaluation)

RP7 - Investigating photosynthesis
(Focus -Evaluation)

Reactions (Part 2)

- Atoms in Chemical Reactions
- Combustion
- Thermal Decomposition
- Conservation of Mass
- Endothermic and Exothermic Reactions
- Energy Level Diagrams
- Bond Energies

RP 1

Organisms (Part 2)

- The Breathing System
- Gas Exchange
- Drugs
- Alcohol
- Smoking
- Nutrients
- Food Tests
- Diet
- Digestive System
- Enzymes and Digestion

RP 2

RP 3

Forces (Part 2)

- Friction and Drag
- Squashing and Stretching
- Turning Forces
- Pressure in Gases
- Pressure in Liquids
- Stress on Solids

RP 4

RP 5

P1 - Fundamentals of Physics

- Energy stores
- Kinetic energy
- Gravitational potential energy
- Energy resources
- Work
- Power
- Efficiency
- Conservation of energy

C1 - Fundamentals of Chemistry

- Atoms, Elements, Compounds and Mixtures
- Separating Mixtures - Solids
- Separating Mixtures - Liquids
- Separating Mixtures – Soluble Compounds
- Evolution of the Atomic Model
- The Structure of an Atom
- Electronic Structure
- Development of the Periodic Table
- Group 0 and Group 1
- Group 7

Summative Assessment 1

B1 Fundamentals of Biology

- Cell structure
- Microscopy
- Specialised cells and differentiation
- Mitosis
- Stem cells
- Diffusion
- Osmosis
- tissues (osmosis)
- Active Transport
- Exchange surfaces

RP 6

RP 7

Summative Assessment 2

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Year 9 KS3 Science Curriculum Roadmap

Required Practical

RP1 - Endothermic and exothermic reactions
(Focus - Results tables)

RP2 - Food tests
(Focus – Method writing)

RP3 - Investigating the action of carbohydrase on the breakdown of starch
(Focus - Evaluation)

RP4 - Extension of a spring
(Focus – variables, prediction and analysis)

RP5 - Stresses on solids
(Focus - Analysis)

RP6 - use a light microscope to observe, draw and label a selection of plant and animal cells. A magnification scale must be included.

RP7 - investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.

B1 - Cell Biology

- Assessment and gap fill

B2 - Organisation

- Cell Organisation
- Digestion system
- Enzymes and digestion
- The lungs
- The Heart and cardiovascular disease
- Blood and blood vessels
- Health and Disease
- Risk factors for Non-communicable diseases
- Cancer
- Plant Organisation
- Transpiration, Translocation and Stomata

RP 4

RP 5

B3 - Infection and Response

RP 2

SEPARATE BIOLOGY ONLY

- Culturing microorganisms
- Binary fission
- HT - Producing monoclonal antibodies and uses
- Identification of plant disease
- Plant defence responses

- Communicable diseases and defence systems
- Bacterial diseases
- Viral diseases
- Fungal and protist diseases
- Fighting Disease: The immune system
- Fighting Disease: Vaccinations
- Fighting Disease: Drugs - Antibiotics and painkillers
- Fighting Disease: Developing drugs

Summative Assessment 1

B4 - Bioenergetics

- Photosynthetic reaction and rates of photosynthesis
- Uses of glucose from photosynthesis
- Aerobic and anaerobic respiration
- Response to Exercise
- Metabolism

RP 6

Summative Assessment 2

Year 10 KS4 Biology Curriculum Roadmap

LATHOM HIGH SCHOOL

Required Practical

RP 2 (SEPARATE BIOLOGY ONLY) - investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition

RP 4 - use qualitative reagents to test for a range of carbohydrates, lipids and proteins. To include: Benedict's test for sugars; iodine test for starch; and Biuret reagent for protein

RP 5 - investigate the effect of pH on the rate of reaction of amylase enzyme. Students should use a continuous sampling technique to determine the time taken to completely digest a starch solution at a range of pH values. Iodine reagent is to be used to test for starch every 30 seconds. Temperature must be controlled by use of a water bath or electric heater

RP 6 - investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.

B5 - Homeostasis and Response

RP 7

- Homeostasis
- The human nervous system
- The Human endocrine system
- Control of blood glucose concentration
- HT - Negative feedback control of glucose levels
- HT - Digestion of proteins from diet results in excess amino acids
- HT - Describe the effect of ADH on the permeability of the kidney tubules
- HT - Water level in the body is controlled by the hormone ADH
- Hormones in human reproduction (the menstrual cycle)
- Contraception
- HT - The use of hormones to treat infertility
- HT - Negative feedback

SEPARATE BIOLOGY ONLY

- The brain
- The eye
- Control of body temperature
- Maintaining water and nitrogen balance in the body
- Plant hormones – control and coordination
- HT - Using plant hormones

RP 8

Mock Exam

B7 - Ecology

SEPARATE BIOLOGY ONLY

- Decomposition
- HT – Impact of environmental change
- Trophic levels in an ecosystem
- Food production and security

RP 10

- Adaptations, interdependence and competition
- Abiotic and Biotic factors
- Levels of organisation
- How materials are cycled
- Biodiversity and the effect of human interaction on ecosystems

RP 9

B6 - Inheritance, variation and evolution

- Reproduction (sexual and asexual)
- Meiosis
- DNA and the genome
- Genetic inheritance, disorders and sex determination
- Variation and evolution
- Selective breeding and genetic engineering
- Evidence for evolution, fossils and extinction
- Resistant bacteria
- Classification of living organisms

SEPARATE BIOLOGY ONLY

- Advantages and disadvantages of sexual and asexual reproduction
- DNA structure
- HT –protein synthesis and how genetic variants may influence phenotype
- Cloning
- Theory of evolution
- Speciation
- Understanding genetics

GAP Analysis

- **Assessments, past paper practice and targeted revision**

GCSE EXAMS START

Year 11 KS4 Biology Curriculum Roadmap

LATHOM HIGH SCHOOL

Required Practical

RP 7 - plan and carry out an investigation into the effect of a factor on human reaction time

RP 8 (SEPARATE BIOLOGY ONLY) : investigate the effect of light or gravity on the growth of newly germinated seedlings. Record results as both length measurements and as careful, labelled biological drawings to show the effects

RP9 - measure the population size of a common species in a habitat. Use sampling techniques to investigate the effect of a factor on the distribution of this species

RP10 (SEPARATE BIOLOGY ONLY)- investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change

C1 - Atomic Structure and the Periodic Table

- Assessment and gap fill

SEPARATE CHEM ONLY
- Transition metals

C2 - Structure, Bonding and the Properties of Matter

- States of Matter
- Formation of Ions
- Ionic bonding
- Ionic compounds
- Covalent bonding
- Simple Covalent Molecules
- Giant Covalent Structures
- Graphene and Fullerenes
- Metallic Bonding, metallic lattice structures and alloys
- Polymers

SEPARATE CHEM ONLY
- Particle size
- Nano particles

Summative Assessment 1

C4 - Chemical Changes

SEPARATE CHEM ONLY

RP 2 (CO)

- Titrations
- HT - Determination of the concentration of one of the solutions in mol/dm³ and g/dm³ from the reacting volumes and the known concentration of the other solution

- Reactivity series of metals
- Extracting metals -Displacement reactions and carbon reduction
- HT - REDOX reactions
- Electrolysis of melts and Extraction of Aluminum
- Electrolysis of solutions
- Acids, Alkalis, neutralisation and the pH scale
- Reactions of acids with metals
- Reactions of acids with insoluble base

RP 3

RP 1

C3 - Quantitative Chemistry

SEPARATE CHEM ONLY
- Percentage Yield
- Atom Economy
- HT - Using Concentrations of Solutions
- HT - Volumes of gases

- Relative Formula Mass
- HT - Moles
- Conservation of mass and balanced equations
- Chemical Measurements
- HT - Theoretical Yield (Reacting masses)
- HT - Limiting Reactants
- Concentration of solutions

C5 - Energy Changes

- Endothermic and Exothermic Reactions
- Reaction profiles (energy level diagrams)
- HT - Calculating energy changes in reactions (bond energies)

RP 4

SEPARATE CHEM ONLY
- Cells and Batteries
- Fuel Cells

Summative Assessment 2

C6 - Rates of Chemical Change

- Calculating rates of reaction
- Interpret graphs for rates of reactions
- How concentration effects rates of reaction
- How surface area effects rates of reaction
- How temperature effects rates of reaction
- How a catalyst effects rates of reaction.
- Reversible reactions and energy changes
- Equilibrium
- HT – Le Chateliers Principle

RP 5

Required Practical

RP1 - Preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution.

RP2 (SEPARATE CHEM ONLY) - Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration.

RP3 - Investigate what happens when aqueous solutions are electrolysed using inert electrodes. This should be an investigation involving developing a hypothesis.

RP4 - Investigate the variables that affect temperature changes in reacting solutions such as, acid plus metals, acid plus carbonates, neutralisations, displacement of metals.

RP5 - Investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity. This should be an investigation developing a hypothesis.

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Year 10 KS4 Chemistry Curriculum Roadmap

C7 - Organic Chemistry

- Crude Oil and Hydrocarbons
- Fractional Distillation
- Combustion
- Cracking

SEPARATE CHEM ONLY

- Alkenes and their reactions
- Alcohols and their reactions
- Carboxylic acids; esters and their reactions
- Addition Polymerisation
- Properties of polymers
- HT - Condensation polymerization
- HT - DNA and other natural polymers

C8 - Chemical Analysis

- Pure substances, mixtures and formulations
- Testing for gases

RP 6

SEPARATE CHEM ONLY

- Instrumental analysis / Flame emission spectroscopy

RP 7

Mock Exam

C10 -Using Resources

SEPARATE CHEM ONLY

- Corrosion (Rusting) and its prevention
- Alloys as useful materials
- Glass, ceramics, polymers and composites
- Haber Process
- NPK Fertilisers (production and uses)

- Earth's Resources and Sustainable Development
- Reducing the use of resources
- HT- Alternative Methods of Extracting Metals
- Life Cycle Assessments
- Potable Water
- Waste Water Treatment

RP 8

C9 - Chemistry of the atmosphere

- History and Evolution of the Earth's Atmosphere
- The Greenhouse Effect
- Climate Change, Carbon footprint and its reduction
- Atmospheric Pollutants

GAP Analysis

- **Assessments, past paper practice and targeted revision**

GCSE Start

Year 11 KS4 Chemistry Curriculum Roadmap

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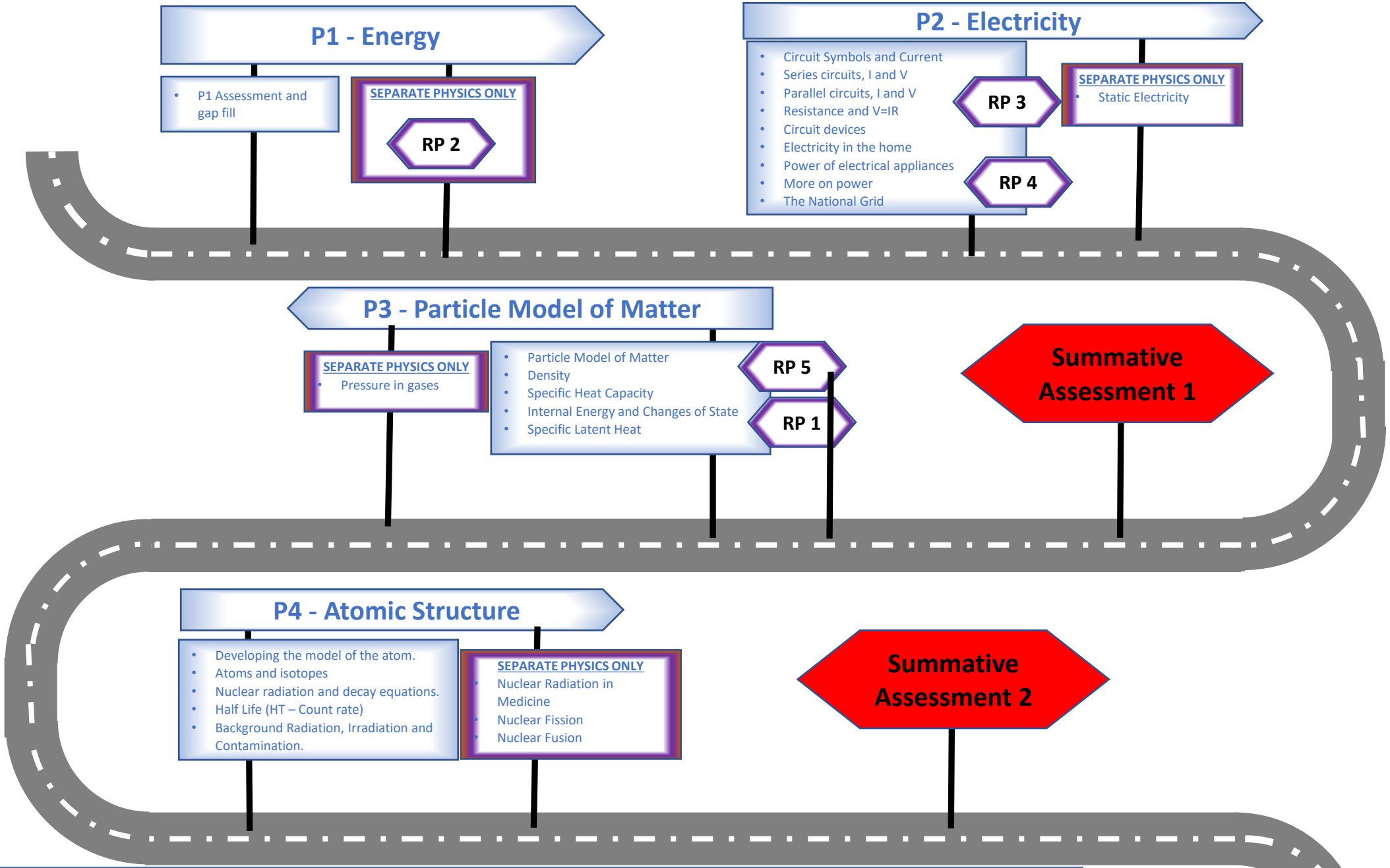
Required Practical

RP6 - Investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values

RP7 (SEPARATE CHEM ONLY) - Use of chemical tests to identify the ions in unknown single ionic compounds. Covering testing for positive ions (metals ions) and negative ions (Carbonates, Halides and sulfates)

RP8 - Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation



Year 10 KS4 Physics Curriculum Roadmap

LATHOM HIGH SCHOOL

Required Practical

RP1 - Investigation to determine the specific heat capacity of one or more materials. The investigation will involve linking the decrease of one energy store (or work done) to the increase in temperature and subsequent increase in thermal energy stored.

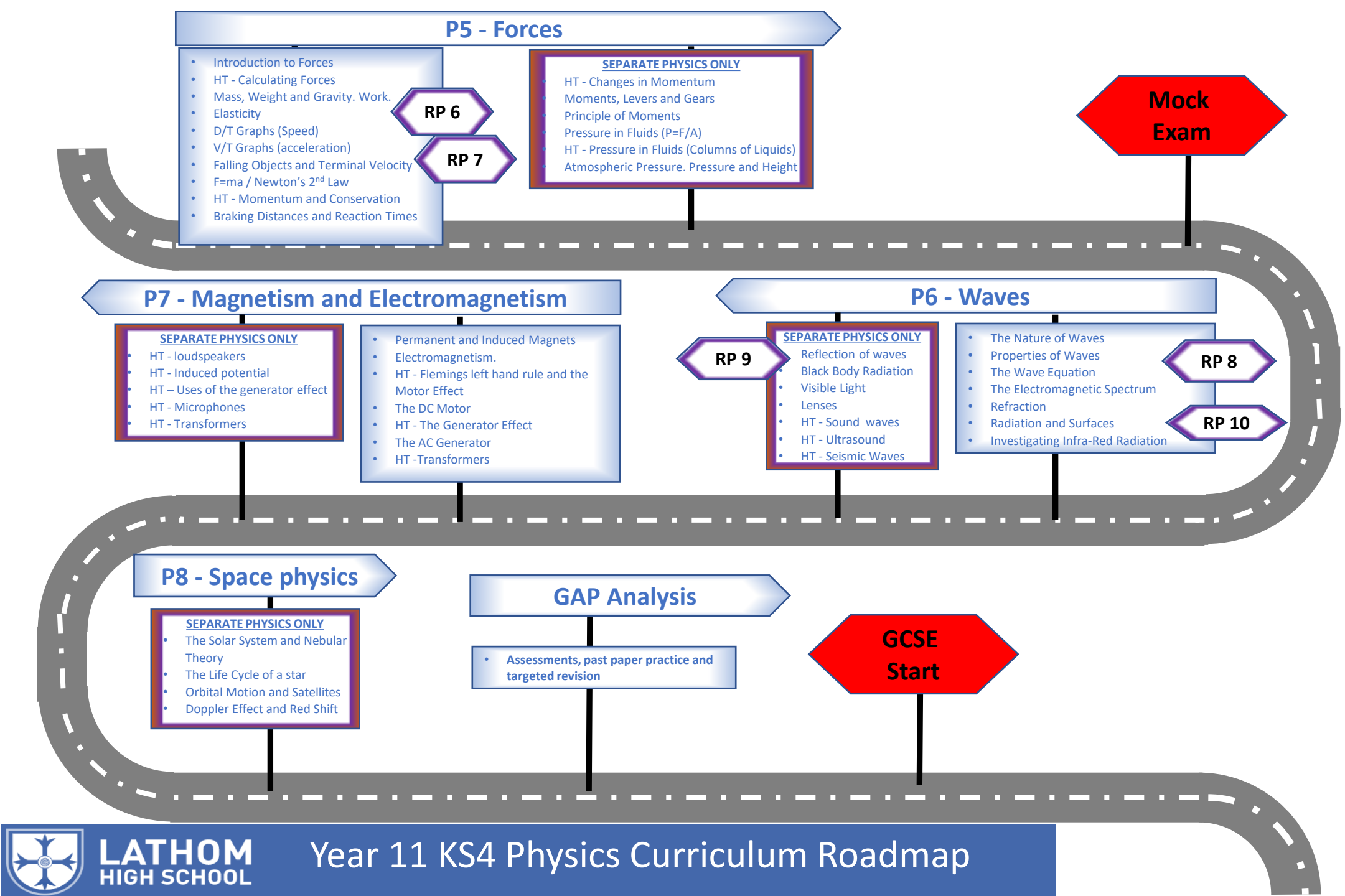
RP2 (SEPARATE PHYSICS ONLY) - investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.

RP3 - Use circuit diagrams to set up and check appropriate circuits to investigate the factors affecting the resistance of electrical circuits. This should include:

- The length of a wire at constant temperature
- Combinations of resistors in series and parallel.

RP4 -use circuit diagrams to construct appropriate circuits to investigate the I–V characteristics of a variety of circuit elements, including a filament lamp, a diode and a resistor at constant temperature.

RP5 - use appropriate apparatus to make and record the measurement s needed to determine the densities of regular and irregular solid objects and liquids. Volume should
be determined from the dimensions of regularly shaped objects, and by a displacement technique for irregularly shaped objects. Dimensions to be measured using appropriate apparatus such as a
ruler, micrometer or Vernier callipers.



Required Practical

RP6 - : investigate the relationship between force and extension for a spring.

RP7 - : investigate the effect of varying the force on the acceleration of an object of constant mass, and the effect of varying the mass of an object on the acceleration produced by a constant force

RP8 - make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.

RP9 (SEPARATE PHYSICS ONLY) - : investigate the reflection of light by different types of surface and the refraction of light by different substances

RP10 - : investigate how the amount of infrared radiation absorbed or radiated by a surface depends on the nature of that surface.

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Year 11 KS4 Physics Curriculum Roadmap