



Primary 4 Science

Complete Knowledge Point List V3 | Master Matrix V7 Derived | MOE 2023

PDF reference edition with repeated headings, complete row coverage and audit-friendly split views.

Source workbook: Primary_4_Science_Complete_KP_List_V3_Master_Derived_MOE_2023.xlsx

1. Overview

Level	Weeks	Atomic KPs	KP IDs	MOE audit blocks	Spiral records	Source control	Version
P4	40	160	P4-W01-KP1 to P4-W40-KP4	8	40	V7 Master Matrix	V3 Master-Derived
Workbook structure and audit use							
Weekly KP Plan	40-week sequence; topics, focus, stage, retrieval and scope boundary						
Atomic KP Register	160 assessable outcomes with stable master KP IDs						
Progression Map	Prior prerequisite -> current-year depth -> next-year bridge						
Spiral Retrieval Map	Named retrieval, scientific practice and checkpoint form for every week						
MOE Coverage Audit	Outcome-level coverage and boundary safeguards inherited from V7						
Assessment Blueprint	Rules for current/recent/spaced knowledge, visuals, data and inquiry						
Sources & Governance	Official sources and V7 governance controls						
Academic rule: "advanced" means deeper reasoning, unfamiliar but age-appropriate contexts, model/data interpretation and evidence-based explanation. It does not mean importing later-level terminology or content. Every future assessment item should cite its source KP ID(s).							

2. Weekly KP Plan - Curriculum and Weekly Focus

Week	Term	Term Week	Theme	Topic	Weekly Focus	Practice	Values / Attitudes	Stage
1	1	1	Systems	Plant parts and functions	Plant-system overview	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Introduce
2	1	2	Systems	Plant parts and functions	Roots	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Develop
3	1	3	Systems	Plant parts and functions	Stems	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Develop
4	1	4	Systems	Plant parts and functions	Leaves	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Develop
5	1	5	Systems	Plant parts and functions	Plant-part comparison	Interpret; analyse; communicate	Curiosity; responsibility; care and concern	Apply / Consolidate
6	1	6	Systems	Plant parts and functions	Whole-plant application	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Apply / Consolidate
7	1	7	Systems	Plant parts and functions	Plant observation investigation	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Master / Transfer
8	1	8	Systems	Human digestive system	Overview of human body systems	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Introduce
9	1	9	Systems	Human digestive system	Digestive-system pathway	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Develop
10	1	10	Systems	Human digestive system	Mouth and gullet	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Develop
11	2	1	Systems	Human digestive system	Stomach	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Develop
12	2	2	Systems	Human digestive system	Small intestine	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Apply / Consolidate
13	2	3	Systems	Human digestive system	Large intestine	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Apply / Consolidate
14	2	4	Systems	Human digestive system	Integrated digestion	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Master / Transfer
15	2	5	Cycles	Matter	What is matter	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Introduce
16	2	6	Cycles	Matter	Solids, liquids and gases	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Develop
17	2	7	Cycles	Matter	Measuring mass	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Develop
18	2	8	Cycles	Matter	Measuring volume	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Apply / Consolidate
19	2	9	Cycles	Matter	Matter mastery	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Master / Transfer
20	2	10	Energy	Light	Sources of light and seeing objects	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Introduce
21	3	1	Energy	Light	Light travels in straight lines	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Develop
22	3	2	Energy	Light	Shadow formation	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Develop
23	3	3	Energy	Light	Shadow shape and object position	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Develop
24	3	4	Energy	Light	Shadow size variables	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Apply / Consolidate
25	3	5	Energy	Light	Complete and partial blocking	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Apply / Consolidate
26	3	6	Energy	Light	Light investigation	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Master / Transfer
27	3	7	Energy	Heat	Heat sources and heat as energy	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Introduce
28	3	8	Energy	Heat	Temperature and measurement	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Develop
29	3	9	Energy	Heat	Direction of heat flow	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Develop
30	3	10	Energy	Heat	Heat gain, heat loss and temperature	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Develop
31	4	1	Energy	Heat	Expansion and contraction	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Apply / Consolidate
32	4	2	Energy	Heat	Changes of state from heat gain or loss	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Apply / Consolidate
33	4	3	Energy	Heat	Conductors of heat	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Apply / Consolidate
34	4	4	Energy	Heat	Heat mastery and P4 transfer	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Master / Transfer
35	4	5	Integration	P4 inquiry and mastery	Fair-test design	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Introduce
36	4	6	Integration	P4 inquiry and mastery	Tables and graphs	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Develop
37	4	7	Integration	P4 inquiry and mastery	Diagram and model reasoning	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Develop
38	4	8	Integration	P4 inquiry and mastery	Cross-topic application	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Apply / Consolidate
39	4	9	Integration	P4 inquiry and mastery	Misconception repair	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Apply / Consolidate
40	4	10	Integration	P4 inquiry and mastery	P4 cumulative mastery	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Master / Transfer

2. Weekly KP Plan - Atomic KP Summary, Retrieval and Scope

Week	Atomic KP Summary	Named Spiral Retrieval	Observable Behaviour	Vocabulary	Scope Boundary
1	1. Identify root, stem and leaf as main plant parts 2. State that plant parts work together as a system 3. Match each main plant part to its position on a plant 4. Use a labelled plant diagram to explain how parts support survival	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains plant-system overview accurately using relevant evidence	plant, parts, functions, system, overview, identify, root, stem, leaf, main	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
2	1. Identify roots on familiar plants 2. State that roots anchor the plant 3. State that roots take in water 4. Use evidence from a root investigation to explain a root function	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains roots accurately using relevant evidence	plant, parts, functions, roots, identify, familiar, plants, state, anchor, take	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
3	1. Identify the stem of a plant 2. State that the stem supports leaves and flowers 3. State that the stem connects roots and leaves 4. Predict a plant consequence when its stem is badly damaged	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains stems accurately using relevant evidence	plant, parts, functions, stems, identify, stem, state, supports,, leaves, flowers	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
4	1. Identify leaves as plant parts 2. State that leaves make food for the plant 3. Relate leaf position to receiving light 4. Use observations to infer whether a leaf is functioning normally	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains leaves accurately using relevant evidence	plant, parts, functions, leaves, identify, state, make, food, relate, leaf	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
5	1. Compare roots, stems and leaves by observable features 2. Compare the functions of roots, stems and leaves 3. Classify a shown plant structure by its function 4. Correct a plant-parts model using observable evidence	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains plant-part comparison accurately using relevant evidence	plant, parts, functions, part, comparison, compare, roots, stems, leaves, observable	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
6	1. Explain how roots and stems support an upright plant 2. Explain why leaves depend on other plant parts 3. Trace a simple water path from surroundings to leaves without naming tubes 4. Evaluate a claim that one plant part can work independently	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains whole-plant application accurately using relevant evidence	plant, parts, functions, whole, application, explain, how, roots, stems, support	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
7	1. Make a labelled drawing of observable plant parts 2. Record changes in a plant consistently over time 3. Identify one variable to keep the same in a plant comparison 4. Use recorded evidence to support a conclusion	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Explains plant observation investigation accurately using relevant evidence	plant, parts, functions, observation, investigation, make, labelled, drawing, observable, record	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning
8	1. Identify digestive, respiratory, circulatory, skeletal and muscular systems 2. State one broad function of each named human system 3. Distinguish a body system from a single organ 4. Match familiar activities to the systems involved	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains overview of human body systems accurately using relevant evidence	human, digestive, system, overview, body, systems, identify, respiratory, circulatory, skeletal	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
9	1. Identify mouth, gullet, stomach, small intestine and large intestine 2. Arrange digestive parts in the correct pathway 3. Trace food through the digestive system 4. Correct an incorrectly ordered digestive-system diagram	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains digestive-system pathway accurately using relevant evidence	human, digestive, system, pathway, identify, mouth, gullet, stomach, small, intestine	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
10	1. State that digestion begins in the mouth 2. State that the gullet carries food to the stomach 3. Distinguish movement through the gullet from digestion in the mouth 4. Use a diagram to explain what happens before food reaches the stomach	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains mouth and gullet accurately using relevant evidence	human, digestive, system, mouth, gullet, state, digestion, begins, carries, food	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
11	1. Identify the stomach in a body diagram 2. State the role of the stomach in digestion 3. Distinguish the stomach from the small intestine 4. Predict the next organ food enters after the stomach	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains stomach accurately using relevant evidence	human, digestive, system, stomach, identify, body, diagram, state, role, digestion	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
12	1. Identify the small intestine 2. State that digestion is completed in the small intestine 3. State that digested food is absorbed in the small intestine 4. Use evidence to explain why the small intestine is important	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains small intestine accurately using relevant evidence	human, digestive, system, small, intestine, identify, state, digestion, completed, digested	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
13	1. Identify the large intestine 2. State that water is absorbed from undigested food in the large intestine 3. Distinguish small-intestine and large-intestine functions 4. Interpret a digestive-system model with one missing function	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains large intestine accurately using relevant evidence	human, digestive, system, large, intestine, identify, state, water, absorbed, undigested	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
14	1. Explain why digestion requires several connected parts 2. Trace food and state the main function at each stage 3. Compare two digestive-system diagrams for accuracy 4. Evaluate a claim that digestion happens only in the stomach	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Explains integrated digestion accurately using relevant evidence	human, digestive, system, integrated, digestion, explain, why, requires, several, connected	P4 boundary: detailed enzymes, villi and biochemical digestion are not required
15	1. State that matter is anything that has mass and occupies space 2. Use evidence of mass and occupied space to decide whether something is matter 3. Recognise solids, liquids and gases as matter 4. Reject the claim that gases are not matter because they cannot always be seen	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Explains what is matter accurately using relevant evidence	matter, what, state, anything, has, mass, occupies, space, use, evidence	P4 boundary: density, particle theory and gas laws are not required
16	1. State that a solid has a fixed shape and fixed volume 2. State that a liquid has no fixed shape but has fixed volume 3. State that a gas has no fixed shape and no fixed volume 4. Compare the three states using a shape-and-volume table	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Explains solids, liquids and gases accurately using relevant evidence	matter, solids, liquids, gases, state, solid, has, fixed, shape, volume	P4 boundary: density, particle theory and gas laws are not required
17	1. Select an appropriate balance for measuring mass 2. Read a mass scale with the correct unit 3. Record mass measurements consistently 4. Evaluate whether a mass measurement method is suitable	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Explains measuring mass accurately using relevant evidence	matter, measuring, mass, select, appropriate, balance, read, scale, correct, unit	P4 boundary: density, particle theory and gas laws are not required
18	1. Select a measuring cylinder or suitable apparatus for volume 2. Read liquid volume at the correct scale position 3. Determine volume of a regular or displaced object using provided apparatus at P4 level 4. Evaluate a volume-measurement setup and suggest one improvement	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Explains measuring volume accurately using relevant evidence	matter, measuring, volume, select, cylinder, suitable, apparatus, read, liquid, correct	P4 boundary: density, particle theory and gas laws are not required
19	1. Classify unfamiliar examples as solid, liquid or gas using shape and volume 2. Interpret mass and volume data without using density 3. Correct a model that confuses amount, mass and volume 4. Construct an evidence-based explanation that something is matter	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Explains matter mastery accurately using relevant evidence	matter, mastery, classify, unfamiliar, examples, solid, liquid, gas, shape, volume	P4 boundary: density, particle theory and gas laws are not required
20	1. Identify objects that are sources of light 2. State that a non-luminous object is seen when it reflects light 3. Distinguish a light source from an object that only reflects light 4. Use a ray-path sketch to explain how an object is seen	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains sources of light and seeing objects accurately using relevant evidence	light, sources, seeing, objects, identify, state, non, luminous, object, seen	P4 boundary: refraction, lenses and quantitative ray calculations are not required
21	1. State that light travels in straight lines 2. Use aligned holes as evidence that light travels straight 3. Predict whether light reaches a screen through a path 4. Correct a diagram showing a bent light path in one medium	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains light travels in straight lines accurately using relevant evidence	light, travels, straight, lines, state, use, aligned, holes, evidence, predict	P4 boundary: refraction, lenses and quantitative ray calculations are not required
22	1. State that a shadow forms when light is blocked completely or partially 2. Identify light source, object, screen and shadow 3. Predict the position of a shadow 4. Explain shadow formation using straight-line travel of light	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains shadow formation accurately using relevant evidence	light, shadow, formation, state, forms, when, blocked, completely, partially, identify	P4 boundary: refraction, lenses and quantitative ray calculations are not required
23	1. Relate shadow shape to object shape and orientation 2. Predict how moving an object changes shadow position 3. Compare shadow evidence from two object positions 4. Design a fair comparison of shadow position	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains shadow shape and object position accurately using relevant evidence	light, shadow, shape, object, position, relate, orientation, predict, how, moving	P4 boundary: refraction, lenses and quantitative ray calculations are not required
24	1. Relate shadow size to source-object distance 2. Relate shadow size to object-screen distance 3. Interpret shadow-size data from a fair test 4. Identify variables to change, measure and keep the same	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains shadow size variables accurately using relevant evidence	light, shadow, size, variables, relate, source, object, distance, screen, interpret	P4 boundary: refraction, lenses and quantitative ray calculations are not required
25	1. Compare complete and partial blocking of light 2. Infer blocking degree from the shadow formed 3. Choose a material for a required light-blocking purpose using evidence 4. Explain without requiring transparent, translucent or opaque terminology	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains complete and partial blocking accurately using relevant evidence	light, complete, partial, blocking, compare, infer, degree, shadow, formed, choose	P4 boundary: refraction, lenses and quantitative ray calculations are not required
26	1. Formulate a testable question about shadows 2. Construct a fair shadow investigation 3. Record results in a table or simple graph 4. Evaluate whether the evidence supports the conclusion	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Explains light investigation accurately using relevant evidence	light, investigation, formulate, testable, question, about, shadows, construct, fair, shadow	P4 boundary: refraction, lenses and quantitative ray calculations are not required
27	1. Identify common sources of heat 2. State that heat is a form of energy 3. Distinguish a heat source from an object warmed by it 4. Explain a familiar heating situation using a heat source	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains heat sources and heat as energy accurately using relevant evidence	heat, sources, energy, identify, common, state, form, distinguish, source, object	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
28	1. State that temperature measures degree of hotness 2. Read a thermometer scale correctly 3. Use a datalogger or temperature sensor reading 4. Distinguish temperature from heat	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains temperature and measurement accurately using relevant evidence	heat, temperature, measurement, state, measures, degree, hotness, read, thermometer, scale	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
29	1. State that heat flows from hotter to colder regions 2. Predict the direction of heat flow between two objects 3. State that heat flow continues until both reach the same temperature 4. Use temperature data to justify heat-flow direction	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains direction of heat flow accurately using relevant evidence	heat, direction, flow, state, flows, hotter, colder, regions, predict, between	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
30	1. Relate heat gain to a temperature increase 2. Relate heat loss to a temperature decrease 3. Interpret a temperature-time graph 4. Explain a plateau or change using evidence appropriate to P4	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains heat gain, heat loss and temperature accurately using relevant evidence	heat, gain, loss, temperature, relate, increase, decrease, interpret, time, graph	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
31	1. State that solids, liquids and gases may expand when heated 2. State that objects may contract when cooled 3. Identify everyday effects of expansion or contraction 4. Use before-and-after evidence to infer heat gain or loss	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains expansion and contraction accurately using relevant evidence	heat, expansion, contraction, state, solids, liquids, gases, may, expand, when	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
32	1. Recognise melting as an effect of heat gain 2. Recognise freezing as an effect of heat loss 3. Distinguish a change of state from expansion 4. Apply heat gain or loss to an everyday state change	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains changes of state from heat gain or loss accurately using relevant evidence	heat, changes, state, gain, loss, recognise, melting, effect, freezing, distinguish	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
33	1. Identify metals as generally good conductors of heat 2. Identify wood, plastics, air and rubber as poor conductors of heat 3. Choose a material for a heat-related use 4. Design a fair comparison of heat conduction	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains conductors of heat accurately using relevant evidence	heat, conductors, identify, metals, generally, good, wood, plastics, air, rubber	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
34	1. Retrieve heat, temperature, flow and material ideas 2. Apply heat ideas to a multi-step everyday context 3. Interpret thermometer, table and graph evidence together 4. Evaluate and improve a heat investigation	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Explains heat mastery and p4 transfer accurately using relevant evidence	heat, mastery, transfer, retrieve, temperature, flow, material, ideas, apply, multi	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5
35	1. Formulate a testable P4 science question 2. Identify changed, measured and controlled variables 3. Choose suitable observations or measurements 4. Evaluate whether a proposed test is fair	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains fair-test design accurately using relevant evidence	inquiry, mastery, fair, test, design, formulate, testable, science, question, identify	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms
36	1. Record P4 observations in a clear table 2. Read scales and units accurately 3. Describe a pattern from a bar or line graph 4. Use graph evidence without extending beyond the data	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains tables and graphs accurately using relevant evidence	inquiry, mastery, tables, graphs, record, observations, clear, table, read, scales	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms
37	1. Interpret labelled plant, digestive, light or heat diagrams 2. Identify a missing or incorrect model feature 3. Explain why the feature matters scientifically 4. Revise the model using evidence	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains diagram and model reasoning accurately using relevant evidence	inquiry, mastery, diagram, model, reasoning, interpret, labelled, plant, digestive, light	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms
38	1. Select the relevant P4 topic for a novel situation 2. Connect two P4 ideas without importing P5 content 3. Support an explanation with observations or data 4. Compare an alternative explanation	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains cross-topic application accurately using relevant evidence	inquiry, mastery, cross, topic, application, select, relevant, novel, situation, connect	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms
39	1. Distinguish heat from temperature 2. Distinguish seeing by reflected light from being a light source 3. Distinguish digestion from movement of food 4. Distinguish P4 plant functions from P5 transport details	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains misconception repair accurately using relevant evidence	inquiry, mastery, misconception, repair, distinguish, heat, temperature, seeing, reflected, light	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms
40	1. Retrieve all P4 core outcomes 2. Apply P4 knowledge to unfamiliar representations 3. Communicate a complete evidence-based explanation 4. Evaluate and improve a method, model or conclusion	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Explains p4 cumulative mastery accurately using relevant evidence	inquiry, mastery, cumulative, retrieve, all, core, outcomes, apply, knowledge, unfamiliar	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms

3. Atomic KP Register - Atomic KP Content View

KP ID	Week	Theme	Topic	Weekly Focus	No.	Atomic Knowledge Point	Stage	Status	Cognitive Demand
P4-W01-KP1	1	Systems	Plant parts and functions	Plant-system overview	1	Identify root, stem and leaf as main plant parts	Introduce	MOE Explicit Core	Know / Understand
P4-W01-KP2	1	Systems	Plant parts and functions	Plant-system overview	2	State that plant parts work together as a system	Introduce	MOE Explicit Core	Explain / Interpret
P4-W01-KP3	1	Systems	Plant parts and functions	Plant-system overview	3	Match each main plant part to its position on a plant	Introduce	MOE Practice / Application	Apply / Analyse
P4-W01-KP4	1	Systems	Plant parts and functions	Plant-system overview	4	Use a labelled plant diagram to explain how parts support survival	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W02-KP1	2	Systems	Plant parts and functions	Roots	1	Identify roots on familiar plants	Develop	MOE Explicit Core	Know / Understand
P4-W02-KP2	2	Systems	Plant parts and functions	Roots	2	State that roots anchor the plant	Develop	MOE Explicit Core	Explain / Interpret
P4-W02-KP3	2	Systems	Plant parts and functions	Roots	3	State that roots take in water	Develop	MOE Practice / Application	Apply / Analyse
P4-W02-KP4	2	Systems	Plant parts and functions	Roots	4	Use evidence from a root investigation to explain a root function	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W03-KP1	3	Systems	Plant parts and functions	Stems	1	Identify the stem of a plant	Develop	MOE Explicit Core	Know / Understand
P4-W03-KP2	3	Systems	Plant parts and functions	Stems	2	State that the stem supports leaves and flowers	Develop	MOE Explicit Core	Explain / Interpret
P4-W03-KP3	3	Systems	Plant parts and functions	Stems	3	State that the stem connects roots and leaves	Develop	MOE Practice / Application	Apply / Analyse
P4-W03-KP4	3	Systems	Plant parts and functions	Stems	4	Predict a plant consequence when its stem is badly damaged	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W04-KP1	4	Systems	Plant parts and functions	Leaves	1	Identify leaves as plant parts	Develop	MOE Explicit Core	Know / Understand
P4-W04-KP2	4	Systems	Plant parts and functions	Leaves	2	State that leaves make food for the plant	Develop	MOE Explicit Core	Explain / Interpret
P4-W04-KP3	4	Systems	Plant parts and functions	Leaves	3	Relate leaf position to receiving light	Develop	MOE Practice / Application	Apply / Analyse
P4-W04-KP4	4	Systems	Plant parts and functions	Leaves	4	Use observations to infer whether a leaf is functioning normally	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W05-KP1	5	Systems	Plant parts and functions	Plant-part comparison	1	Compare roots, stems and leaves by observable features	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W05-KP2	5	Systems	Plant parts and functions	Plant-part comparison	2	Compare the functions of roots, stems and leaves	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W05-KP3	5	Systems	Plant parts and functions	Plant-part comparison	3	Classify a shown plant structure by its function	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W05-KP4	5	Systems	Plant parts and functions	Plant-part comparison	4	Correct a plant-parts model using observable evidence	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W06-KP1	6	Systems	Plant parts and functions	Whole-plant application	1	Explain how roots and stems support an upright plant	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W06-KP2	6	Systems	Plant parts and functions	Whole-plant application	2	Explain why leaves depend on other plant parts	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W06-KP3	6	Systems	Plant parts and functions	Whole-plant application	3	Trace a simple water path from surroundings to leaves without naming tubes	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W06-KP4	6	Systems	Plant parts and functions	Whole-plant application	4	Evaluate a claim that one plant part can work independently	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W07-KP1	7	Systems	Plant parts and functions	Plant observation investigation	1	Make a labelled drawing of observable plant parts	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W07-KP2	7	Systems	Plant parts and functions	Plant observation investigation	2	Record changes in a plant consistently over time	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W07-KP3	7	Systems	Plant parts and functions	Plant observation investigation	3	Identify one variable to keep the same in a plant comparison	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W07-KP4	7	Systems	Plant parts and functions	Plant observation investigation	4	Use recorded evidence to support a conclusion	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve
P4-W08-KP1	8	Systems	Human digestive system	Overview of human body systems	1	Identify digestive, respiratory, circulatory, skeletal and muscular systems	Introduce	MOE Explicit Core	Know / Understand
P4-W08-KP2	8	Systems	Human digestive system	Overview of human body systems	2	State one broad function of each named human system	Introduce	MOE Explicit Core	Explain / Interpret
P4-W08-KP3	8	Systems	Human digestive system	Overview of human body systems	3	Distinguish a body system from a single organ	Introduce	MOE Practice / Application	Apply / Analyse
P4-W08-KP4	8	Systems	Human digestive system	Overview of human body systems	4	Match familiar activities to the systems involved	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W09-KP1	9	Systems	Human digestive system	Digestive-system pathway	1	Identify mouth, gullet, stomach, small intestine and large intestine	Develop	MOE Explicit Core	Know / Understand
P4-W09-KP2	9	Systems	Human digestive system	Digestive-system pathway	2	Arrange digestive parts in the correct pathway	Develop	MOE Explicit Core	Explain / Interpret
P4-W09-KP3	9	Systems	Human digestive system	Digestive-system pathway	3	Trace food through the digestive system	Develop	MOE Practice / Application	Apply / Analyse
P4-W09-KP4	9	Systems	Human digestive system	Digestive-system pathway	4	Correct an incorrectly ordered digestive-system diagram	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W10-KP1	10	Systems	Human digestive system	Mouth and gullet	1	State that digestion begins in the mouth	Develop	MOE Explicit Core	Know / Understand
P4-W10-KP2	10	Systems	Human digestive system	Mouth and gullet	2	State that the gullet carries food to the stomach	Develop	MOE Explicit Core	Explain / Interpret
P4-W10-KP3	10	Systems	Human digestive system	Mouth and gullet	3	Distinguish movement through the gullet from digestion in the mouth	Develop	MOE Practice / Application	Apply / Analyse
P4-W10-KP4	10	Systems	Human digestive system	Mouth and gullet	4	Use a diagram to explain what happens before food reaches the stomach	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W11-KP1	11	Systems	Human digestive system	Stomach	1	Identify the stomach in a body diagram	Develop	MOE Explicit Core	Know / Understand
P4-W11-KP2	11	Systems	Human digestive system	Stomach	2	State the role of the stomach in digestion	Develop	MOE Explicit Core	Explain / Interpret
P4-W11-KP3	11	Systems	Human digestive system	Stomach	3	Distinguish the stomach from the small intestine	Develop	MOE Practice / Application	Apply / Analyse
P4-W11-KP4	11	Systems	Human digestive system	Stomach	4	Predict the next organ food enters after the stomach	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W12-KP1	12	Systems	Human digestive system	Small intestine	1	Identify the small intestine	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W12-KP2	12	Systems	Human digestive system	Small intestine	2	State that digestion is completed in the small intestine	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W12-KP3	12	Systems	Human digestive system	Small intestine	3	State that digested food is absorbed in the small intestine	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W12-KP4	12	Systems	Human digestive system	Small intestine	4	Use evidence to explain why the small intestine is important	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W13-KP1	13	Systems	Human digestive system	Large intestine	1	Identify the large intestine	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W13-KP2	13	Systems	Human digestive system	Large intestine	2	State that water is absorbed from undigested food in the large intestine	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W13-KP3	13	Systems	Human digestive system	Large intestine	3	Distinguish small-intestine and large-intestine functions	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W13-KP4	13	Systems	Human digestive system	Large intestine	4	Interpret a digestive-system model with one missing function	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W14-KP1	14	Systems	Human digestive system	Integrated digestion	1	Explain why digestion requires several connected parts	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W14-KP2	14	Systems	Human digestive system	Integrated digestion	2	Trace food and state the main function at each stage	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W14-KP3	14	Systems	Human digestive system	Integrated digestion	3	Compare two digestive-system diagrams for accuracy	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W14-KP4	14	Systems	Human digestive system	Integrated digestion	4	Evaluate a claim that digestion happens only in the stomach	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve
P4-W15-KP1	15	Cycles	Matter	What is matter	1	State that matter is anything that has mass and occupies space	Introduce	MOE Explicit Core	Know / Understand
P4-W15-KP2	15	Cycles	Matter	What is matter	2	Use evidence of mass and occupied space to decide whether something is matter	Introduce	MOE Explicit Core	Explain / Interpret
P4-W15-KP3	15	Cycles	Matter	What is matter	3	Recognise solids, liquids and gases as matter	Introduce	MOE Practice / Application	Apply / Analyse
P4-W15-KP4	15	Cycles	Matter	What is matter	4	Reject the claim that gases are not matter because they cannot always be seen	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W16-KP1	16	Cycles	Matter	Solids, liquids and gases	1	State that a solid has a fixed shape and fixed volume	Develop	MOE Explicit Core	Know / Understand
P4-W16-KP2	16	Cycles	Matter	Solids, liquids and gases	2	State that a liquid has no fixed shape but has fixed volume	Develop	MOE Explicit Core	Explain / Interpret
P4-W16-KP3	16	Cycles	Matter	Solids, liquids and gases	3	State that a gas has no fixed shape and no fixed volume	Develop	MOE Practice / Application	Apply / Analyse
P4-W16-KP4	16	Cycles	Matter	Solids, liquids and gases	4	Compare the three states using a shape-and-volume table	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W17-KP1	17	Cycles	Matter	Measuring mass	1	Select an appropriate balance for measuring mass	Develop	MOE Explicit Core	Know / Understand
P4-W17-KP2	17	Cycles	Matter	Measuring mass	2	Read a mass scale with the correct unit	Develop	MOE Explicit Core	Explain / Interpret
P4-W17-KP3	17	Cycles	Matter	Measuring mass	3	Record mass measurements consistently	Develop	MOE Practice / Application	Apply / Analyse

KP ID	Week	Theme	Topic	Weekly Focus	No.	Atomic Knowledge Point	Stage	Status	Cognitive Demand
P4-W17-KP4	17	Cycles	Matter	Measuring mass	4	Evaluate whether a mass measurement method is suitable	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W18-KP1	18	Cycles	Matter	Measuring volume	1	Select a measuring cylinder or suitable apparatus for volume	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W18-KP2	18	Cycles	Matter	Measuring volume	2	Read liquid volume at the correct scale position	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W18-KP3	18	Cycles	Matter	Measuring volume	3	Determine volume of a regular or displaced object using provided apparatus at P4 level	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W18-KP4	18	Cycles	Matter	Measuring volume	4	Evaluate a volume-measurement setup and suggest one improvement	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W19-KP1	19	Cycles	Matter	Matter mastery	1	Classify unfamiliar examples as solid, liquid or gas using shape and volume	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W19-KP2	19	Cycles	Matter	Matter mastery	2	Interpret mass and volume data without using density	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W19-KP3	19	Cycles	Matter	Matter mastery	3	Correct a model that confuses amount, mass and volume	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W19-KP4	19	Cycles	Matter	Matter mastery	4	Construct an evidence-based explanation that something is matter	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve
P4-W20-KP1	20	Energy	Light	Sources of light and seeing objects	1	Identify objects that are sources of light	Introduce	MOE Explicit Core	Know / Understand
P4-W20-KP2	20	Energy	Light	Sources of light and seeing objects	2	State that a non-luminous object is seen when it reflects light	Introduce	MOE Explicit Core	Explain / Interpret
P4-W20-KP3	20	Energy	Light	Sources of light and seeing objects	3	Distinguish a light source from an object that only reflects light	Introduce	MOE Practice / Application	Apply / Analyse
P4-W20-KP4	20	Energy	Light	Sources of light and seeing objects	4	Use a ray-path sketch to explain how an object is seen	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W21-KP1	21	Energy	Light	Light travels in straight lines	1	State that light travels in straight lines	Develop	MOE Explicit Core	Know / Understand
P4-W21-KP2	21	Energy	Light	Light travels in straight lines	2	Use aligned holes as evidence that light travels straight	Develop	MOE Explicit Core	Explain / Interpret
P4-W21-KP3	21	Energy	Light	Light travels in straight lines	3	Predict whether light reaches a screen through a path	Develop	MOE Practice / Application	Apply / Analyse
P4-W21-KP4	21	Energy	Light	Light travels in straight lines	4	Correct a diagram showing a bent light path in one medium	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W22-KP1	22	Energy	Light	Shadow formation	1	State that a shadow forms when light is blocked completely or partially	Develop	MOE Explicit Core	Know / Understand
P4-W22-KP2	22	Energy	Light	Shadow formation	2	Identify light source, object, screen and shadow	Develop	MOE Explicit Core	Explain / Interpret
P4-W22-KP3	22	Energy	Light	Shadow formation	3	Predict the position of a shadow	Develop	MOE Practice / Application	Apply / Analyse
P4-W22-KP4	22	Energy	Light	Shadow formation	4	Explain shadow formation using straight-line travel of light	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W23-KP1	23	Energy	Light	Shadow shape and object position	1	Relate shadow shape to object shape and orientation	Develop	MOE Explicit Core	Know / Understand
P4-W23-KP2	23	Energy	Light	Shadow shape and object position	2	Predict how moving an object changes shadow position	Develop	MOE Explicit Core	Explain / Interpret
P4-W23-KP3	23	Energy	Light	Shadow shape and object position	3	Compare shadow evidence from two object positions	Develop	MOE Practice / Application	Apply / Analyse
P4-W23-KP4	23	Energy	Light	Shadow shape and object position	4	Design a fair comparison of shadow position	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W24-KP1	24	Energy	Light	Shadow size variables	1	Relate shadow size to source-object distance	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W24-KP2	24	Energy	Light	Shadow size variables	2	Relate shadow size to object-screen distance	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W24-KP3	24	Energy	Light	Shadow size variables	3	Interpret shadow-size data from a fair test	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W24-KP4	24	Energy	Light	Shadow size variables	4	Identify variables to change, measure and keep the same	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W25-KP1	25	Energy	Light	Complete and partial blocking	1	Compare complete and partial blocking of light	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W25-KP2	25	Energy	Light	Complete and partial blocking	2	Infer blocking degree from the shadow formed	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W25-KP3	25	Energy	Light	Complete and partial blocking	3	Choose a material for a required light-blocking purpose using evidence	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W25-KP4	25	Energy	Light	Complete and partial blocking	4	Explain without requiring transparent, translucent or opaque terminology	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W26-KP1	26	Energy	Light	Light investigation	1	Formulate a testable question about shadows	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W26-KP2	26	Energy	Light	Light investigation	2	Construct a fair shadow investigation	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W26-KP3	26	Energy	Light	Light investigation	3	Record results in a table or simple graph	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W26-KP4	26	Energy	Light	Light investigation	4	Evaluate whether the evidence supports the conclusion	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve
P4-W27-KP1	27	Energy	Heat	Heat sources and heat as energy	1	Identify common sources of heat	Introduce	MOE Explicit Core	Know / Understand
P4-W27-KP2	27	Energy	Heat	Heat sources and heat as energy	2	State that heat is a form of energy	Introduce	MOE Explicit Core	Explain / Interpret
P4-W27-KP3	27	Energy	Heat	Heat sources and heat as energy	3	Distinguish a heat source from an object warmed by it	Introduce	MOE Practice / Application	Apply / Analyse
P4-W27-KP4	27	Energy	Heat	Heat sources and heat as energy	4	Explain a familiar heating situation using a heat source	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W28-KP1	28	Energy	Heat	Temperature and measurement	1	State that temperature measures degree of hotness	Develop	MOE Explicit Core	Know / Understand
P4-W28-KP2	28	Energy	Heat	Temperature and measurement	2	Read a thermometer scale correctly	Develop	MOE Explicit Core	Explain / Interpret
P4-W28-KP3	28	Energy	Heat	Temperature and measurement	3	Use a datalogger or temperature sensor reading	Develop	MOE Practice / Application	Apply / Analyse
P4-W28-KP4	28	Energy	Heat	Temperature and measurement	4	Distinguish temperature from heat	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W29-KP1	29	Energy	Heat	Direction of heat flow	1	State that heat flows from hotter to colder regions	Develop	MOE Explicit Core	Know / Understand
P4-W29-KP2	29	Energy	Heat	Direction of heat flow	2	Predict the direction of heat flow between two objects	Develop	MOE Explicit Core	Explain / Interpret
P4-W29-KP3	29	Energy	Heat	Direction of heat flow	3	State that heat flow continues until both reach the same temperature	Develop	MOE Practice / Application	Apply / Analyse
P4-W29-KP4	29	Energy	Heat	Direction of heat flow	4	Use temperature data to justify heat-flow direction	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W30-KP1	30	Energy	Heat	Heat gain, heat loss and temperature	1	Relate heat gain to a temperature increase	Develop	MOE Explicit Core	Know / Understand
P4-W30-KP2	30	Energy	Heat	Heat gain, heat loss and temperature	2	Relate heat loss to a temperature decrease	Develop	MOE Explicit Core	Explain / Interpret
P4-W30-KP3	30	Energy	Heat	Heat gain, heat loss and temperature	3	Interpret a temperature-time graph	Develop	MOE Practice / Application	Apply / Analyse
P4-W30-KP4	30	Energy	Heat	Heat gain, heat loss and temperature	4	Explain a plateau or change using evidence appropriate to P4	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W31-KP1	31	Energy	Heat	Expansion and contraction	1	State that solids, liquids and gases may expand when heated	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W31-KP2	31	Energy	Heat	Expansion and contraction	2	State that objects may contract when cooled	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W31-KP3	31	Energy	Heat	Expansion and contraction	3	Identify everyday effects of expansion or contraction	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W31-KP4	31	Energy	Heat	Expansion and contraction	4	Use before-and-after evidence to infer heat gain or loss	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W32-KP1	32	Energy	Heat	Changes of state from heat gain or loss	1	Recognise melting as an effect of heat gain	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W32-KP2	32	Energy	Heat	Changes of state from heat gain or loss	2	Recognise freezing as an effect of heat loss	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W32-KP3	32	Energy	Heat	Changes of state from heat gain or loss	3	Distinguish a change of state from expansion	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W32-KP4	32	Energy	Heat	Changes of state from heat gain or loss	4	Apply heat gain or loss to an everyday state change	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W33-KP1	33	Energy	Heat	Conductors of heat	1	Identify metals as generally good conductors of heat	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W33-KP2	33	Energy	Heat	Conductors of heat	2	Identify wood, plastics, air and rubber as poor conductors of heat	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W33-KP3	33	Energy	Heat	Conductors of heat	3	Choose a material for a heat-related use	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W33-KP4	33	Energy	Heat	Conductors of heat	4	Design a fair comparison of heat conduction	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W34-KP1	34	Energy	Heat	Heat mastery and P4 transfer	1	Retrieve heat, temperature, flow and material ideas	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W34-KP2	34	Energy	Heat	Heat mastery and P4 transfer	2	Apply heat ideas to a multi-step everyday context	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W34-KP3	34	Energy	Heat	Heat mastery and P4 transfer	3	Interpret thermometer, table and graph evidence together	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W34-KP4	34	Energy	Heat	Heat mastery and P4 transfer	4	Evaluate and improve a heat investigation	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve
P4-W35-KP1	35	Integration	P4 inquiry and mastery	Fair-test design	1	Formulate a testable P4 science question	Introduce	MOE Explicit Core	Know / Understand

KP ID	Week	Theme	Topic	Weekly Focus	No.	Atomic Knowledge Point	Stage	Status	Cognitive Demand
P4-W35-KP2	35	Integration	P4 inquiry and mastery	Fair-test design	2	Identify changed, measured and controlled variables	Introduce	MOE Explicit Core	Explain / Interpret
P4-W35-KP3	35	Integration	P4 inquiry and mastery	Fair-test design	3	Choose suitable observations or measurements	Introduce	MOE Practice / Application	Apply / Analyse
P4-W35-KP4	35	Integration	P4 inquiry and mastery	Fair-test design	4	Evaluate whether a proposed test is fair	Introduce	MOE Transfer / Evaluation	Evaluate / Improve
P4-W36-KP1	36	Integration	P4 inquiry and mastery	Tables and graphs	1	Record P4 observations in a clear table	Develop	MOE Explicit Core	Know / Understand
P4-W36-KP2	36	Integration	P4 inquiry and mastery	Tables and graphs	2	Read scales and units accurately	Develop	MOE Explicit Core	Explain / Interpret
P4-W36-KP3	36	Integration	P4 inquiry and mastery	Tables and graphs	3	Describe a pattern from a bar or line graph	Develop	MOE Practice / Application	Apply / Analyse
P4-W36-KP4	36	Integration	P4 inquiry and mastery	Tables and graphs	4	Use graph evidence without extending beyond the data	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W37-KP1	37	Integration	P4 inquiry and mastery	Diagram and model reasoning	1	Interpret labelled plant, digestive, light or heat diagrams	Develop	MOE Explicit Core	Know / Understand
P4-W37-KP2	37	Integration	P4 inquiry and mastery	Diagram and model reasoning	2	Identify a missing or incorrect model feature	Develop	MOE Explicit Core	Explain / Interpret
P4-W37-KP3	37	Integration	P4 inquiry and mastery	Diagram and model reasoning	3	Explain why the feature matters scientifically	Develop	MOE Practice / Application	Apply / Analyse
P4-W37-KP4	37	Integration	P4 inquiry and mastery	Diagram and model reasoning	4	Revise the model using evidence	Develop	MOE Transfer / Evaluation	Evaluate / Improve
P4-W38-KP1	38	Integration	P4 inquiry and mastery	Cross-topic application	1	Select the relevant P4 topic for a novel situation	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W38-KP2	38	Integration	P4 inquiry and mastery	Cross-topic application	2	Connect two P4 ideas without importing P5 content	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W38-KP3	38	Integration	P4 inquiry and mastery	Cross-topic application	3	Support an explanation with observations or data	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W38-KP4	38	Integration	P4 inquiry and mastery	Cross-topic application	4	Compare an alternative explanation	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W39-KP1	39	Integration	P4 inquiry and mastery	Misconception repair	1	Distinguish heat from temperature	Apply / Consolidate	MOE Explicit Core	Know / Understand
P4-W39-KP2	39	Integration	P4 inquiry and mastery	Misconception repair	2	Distinguish seeing by reflected light from being a light source	Apply / Consolidate	MOE Explicit Core	Explain / Interpret
P4-W39-KP3	39	Integration	P4 inquiry and mastery	Misconception repair	3	Distinguish digestion from movement of food	Apply / Consolidate	MOE Practice / Application	Apply / Analyse
P4-W39-KP4	39	Integration	P4 inquiry and mastery	Misconception repair	4	Distinguish P4 plant functions from P5 transport details	Apply / Consolidate	MOE Transfer / Evaluation	Evaluate / Improve
P4-W40-KP1	40	Integration	P4 inquiry and mastery	P4 cumulative mastery	1	Retrieve all P4 core outcomes	Master / Transfer	MOE Explicit Core	Know / Understand
P4-W40-KP2	40	Integration	P4 inquiry and mastery	P4 cumulative mastery	2	Apply P4 knowledge to unfamiliar representations	Master / Transfer	MOE Explicit Core	Explain / Interpret
P4-W40-KP3	40	Integration	P4 inquiry and mastery	P4 cumulative mastery	3	Communicate a complete evidence-based explanation	Master / Transfer	MOE Practice / Application	Apply / Analyse
P4-W40-KP4	40	Integration	P4 inquiry and mastery	P4 cumulative mastery	4	Evaluate and improve a method, model or conclusion	Master / Transfer	MOE Transfer / Evaluation	Evaluate / Improve

3. Atomic KP Register - Assessment, Retrieval and Scope View

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W01-KP1	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Short response	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately identify root, stem and leaf as main plant parts, using relevant observation, data or model evidence	plant, parts, functions, system, overview, identify, root, stem, leaf, main	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W01-KP2	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that plant parts work together as a system, using relevant observation, data or model evidence	plant, parts, functions, system, overview, state, work, together	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W01-KP3	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Constructed explanation	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately match each main plant part to its position on a plant, using relevant observation, data or model evidence	plant, parts, functions, system, overview, match, each, main, part, its	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W01-KP4	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Method / model critique	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately use a labelled plant diagram to explain how parts support survival, using relevant observation, data or model evidence	plant, parts, functions, system, overview, use, labelled, diagram, explain, how	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W02-KP1	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Short response	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately identify roots on familiar plants, using relevant observation, data or model evidence	plant, parts, functions, roots, identify, familiar, plants	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W02-KP2	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that roots anchor the plant, using relevant observation, data or model evidence	plant, parts, functions, roots, state, anchor	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W02-KP3	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that roots take in water, using relevant observation, data or model evidence	plant, parts, functions, roots, state, take, water	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W02-KP4	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately use evidence from a root investigation to explain a root function, using relevant observation, data or model evidence	plant, parts, functions, roots, use, evidence, root, investigation, explain, function	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W03-KP1	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Short response	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately identify the stem of a plant, using relevant observation, data or model evidence	plant, parts, functions, stems, identify, stem	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W03-KP2	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that the stem supports leaves and flowers, using relevant observation, data or model evidence	plant, parts, functions, stems, state, stem, supports, leaves, flowers	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W03-KP3	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that the stem connects roots and leaves, using relevant observation, data or model evidence	plant, parts, functions, stems, state, stem, connects, roots, leaves	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W03-KP4	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately predict a plant consequence when its stem is badly damaged, using relevant observation, data or model evidence	plant, parts, functions, stems, predict, consequence, when, its, stem, badly	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W04-KP1	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Short response	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately identify leaves as plant parts, using relevant observation, data or model evidence	plant, parts, functions, leaves, identify	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W04-KP2	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately state that leaves make food for the plant, using relevant observation, data or model evidence	plant, parts, functions, leaves, state, make, food	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W04-KP3	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately relate leaf position to receiving light, using relevant observation, data or model evidence	plant, parts, functions, leaves, relate, leaf, position, receiving, light	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W04-KP4	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately use observations to infer whether a leaf is functioning normally, using relevant observation, data or model evidence	plant, parts, functions, leaves, use, observations, infer, whether, leaf, functioning	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W05-KP1	Interpret; analyse; communicate	Curiosity; responsibility; care and concern	Short response	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately compare roots, stems and leaves by observable features, using relevant observation, data or model evidence	plant, parts, functions, part, comparison, compare, roots, stems, leaves, observable	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W05-KP2	Interpret; analyse; communicate	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately compare the functions of roots, stems and leaves, using relevant observation, data or model evidence	plant, parts, functions, part, comparison, compare, roots, stems, leaves	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W05-KP3	Interpret; analyse; communicate	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately classify a shown plant structure by its function, using relevant observation, data or model evidence	plant, parts, functions, part, comparison, classify, shown, structure, its, function	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W05-KP4	Interpret; analyse; communicate	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately correct a plant-parts model using observable evidence, using relevant observation, data or model evidence	plant, parts, functions, part, comparison, correct, model, observable, evidence	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W06-KP1	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Short response	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately explain how roots and stems support an upright plant, using relevant observation, data or model evidence	plant, parts, functions, whole, application, explain, how, roots, stems, support	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W06-KP2	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately explain why leaves depend on other plant parts, using relevant observation, data or model evidence	plant, parts, functions, whole, application, explain, why, leaves, depend, other	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W06-KP3	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately trace a simple water path from surroundings to leaves without naming tubes, using relevant observation, data or model evidence	plant, parts, functions, whole, application, trace, simple, water, path, surroundings	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W06-KP4	Observe; infer; explain; apply	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately evaluate a claim that one plant part can work independently, using relevant observation, data or model evidence	plant, parts, functions, whole, application, evaluate, claim, one, part, can	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W07-KP1	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Short response	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately make a labelled drawing of observable plant parts, using relevant observation, data or model evidence	plant, parts, functions, observation, investigation, make, labelled, drawing, observable	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W07-KP2	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Diagram / table / graph response	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately record changes in a plant consistently over time, using relevant observation, data or model evidence	plant, parts, functions, observation, investigation, record, changes, consistently, over, time	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W07-KP3	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Constructed explanation	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately identify one variable to keep the same in a plant comparison, using relevant observation, data or model evidence	plant, parts, functions, observation, investigation, identify, one, variable, keep, same	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W07-KP4	Question; hypothesise; investigate; evaluate	Curiosity; responsibility; care and concern	Method / model critique	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Accurately use recorded evidence to support a conclusion, using relevant observation, data or model evidence	plant, parts, functions, observation, investigation, use, recorded, evidence, support, conclusion	P4 boundary: food-/water-carrying tubes, xylem, phloem and photosynthesis requirements are later learning	Verified against V7 compliance register
P4-W08-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately identify digestive, respiratory, circulatory, skeletal and muscular systems, using relevant observation, data or model evidence	human, digestive, system, overview, body, systems, identify, respiratory, circulatory, skeletal	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W08-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state one broad function of each named human system, using relevant observation, data or model evidence	human, digestive, system, overview, body, systems, state, one, broad, function	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W08-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately distinguish a body system from a single organ, using relevant observation, data or model evidence	human, digestive, system, overview, body, systems, distinguish, single, organ	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W08-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately match familiar activities to the systems involved, using relevant observation, data or model evidence	human, digestive, system, overview, body, systems, match, familiar, activities, involved	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W09-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately identify mouth, gullet, stomach, small intestine and large intestine, using relevant observation, data or model evidence	human, digestive, system, pathway, identify, mouth, gullet, stomach, small, intestine	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W09-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately arrange digestive parts in the correct pathway, using relevant observation, data or model evidence	human, digestive, system, pathway, arrange, parts, correct	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W09-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately trace food through the digestive system, using relevant observation, data or model evidence	human, digestive, system, pathway, trace, food, through	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W09-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately correct an incorrectly ordered digestive-system diagram, using relevant observation, data or model evidence	human, digestive, system, pathway, correct, incorrectly, ordered, diagram	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W10-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state that digestion begins in the mouth, using relevant observation, data or model evidence	human, digestive, system, mouth, gullet, state, digestion, begins	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W10-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state that the gullet carries food to the stomach, using relevant observation, data or model evidence	human, digestive, system, mouth, gullet, state, carries, food, stomach	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W10-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately distinguish movement through the gullet from digestion in the mouth, using relevant observation, data or model evidence	human, digestive, system, mouth, gullet, distinguish, movement, through, digestion	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W10-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately use a diagram to explain what happens before food reaches the stomach, using relevant observation, data or model evidence	human, digestive, system, mouth, gullet, use, diagram, explain, what, happens	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W11-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately identify the stomach in a body diagram, using relevant observation, data or model evidence	human, digestive, system, stomach, identify, body, diagram	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W11-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state the role of the stomach in digestion, using relevant observation, data or model evidence	human, digestive, system, stomach, state, role, digestion	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W11-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately distinguish the stomach from the small intestine, using relevant observation, data or model evidence	human, digestive, system, stomach, distinguish, small, intestine	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W11-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately predict the next organ food enters after the stomach, using relevant observation, data or model evidence	human, digestive, system, stomach, predict, next, organ, food, enters, after	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W12-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately identify the small intestine, using relevant observation, data or model evidence	human, digestive, system, small, intestine, identify	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W12-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state that digestion is completed in the small intestine, using relevant observation, data or model evidence	human, digestive, system, small, intestine, state, digestion, completed	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W12-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state that digested food is absorbed in the small intestine, using relevant observation, data or model evidence	human, digestive, system, small, intestine, state, digested, food, absorbed	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W12-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately use evidence to explain why the small intestine is important, using relevant observation, data or model evidence	human, digestive, system, small, intestine, use, evidence, explain, why, important	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W13-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately identify the large intestine, using relevant observation, data or model evidence	human, digestive, system, large, intestine, identify	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W13-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately state that water is absorbed from undigested food in the large intestine, using relevant observation, data or model evidence	human, digestive, system, large, intestine, state, water, absorbed, undigested, food	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W13-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately distinguish small-intestine and large-intestine functions, using relevant observation, data or model evidence	human, digestive, system, large, intestine, distinguish, small, functions	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W13-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately interpret a digestive-system model with one missing function, using relevant observation, data or model evidence	human, digestive, system, large, intestine, interpret, model, one, missing, function	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W14-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately explain why digestion requires several connected parts, using relevant observation, data or model evidence	human, digestive, system, integrated, digestion, explain, why, requires, several, connected	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W14-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately trace food and state the main function at each stage, using relevant observation, data or model evidence	human, digestive, system, integrated, digestion, trace, food, state, main, function	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W14-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately compare two digestive-system diagrams for accuracy, using relevant observation, data or model evidence	human, digestive, system, integrated, digestion, compare, two, diagrams, accuracy	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W14-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Accurately evaluate a claim that digestion happens only in the stomach, using relevant observation, data or model evidence	human, digestive, system, integrated, digestion, evaluate, claim, happens, only, stomach	P4 boundary: detailed enzymes, villi and biochemical digestion are not required	Verified against V7 compliance register
P4-W15-KP1	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Short response	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately state that matter is anything that has mass and occupies space, using relevant observation, data or model evidence	matter, what, state, anything, has, mass, occupies, space	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W15-KP2	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Diagram / table / graph response	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately use evidence of mass and occupied space to decide whether something is matter, using relevant observation, data or model evidence	matter, what, use, evidence, mass, occupied, space, decide, whether, something	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W15-KP3	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Constructed explanation	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately recognise solids, liquids and gases as matter, using relevant observation, data or model evidence	matter, what, recognise, solids, liquids, gases	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W15-KP4	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Method / model critique	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately reject the claim that gases are not matter because they cannot always be seen, using relevant observation, data or model evidence	matter, what, reject, claim, gases, not, because, they, cannot, always	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W16-KP1	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Short response	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately state that a solid has a fixed shape and fixed volume, using relevant observation, data or model evidence	matter, solids, liquids, gases, state, solid, has, fixed, shape, volume	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W16-KP2	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Diagram / table / graph response	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately state that a liquid has no fixed shape but has fixed volume, using relevant observation, data or model evidence	matter, solids, liquids, gases, state, liquid, has, fixed, shape, but	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W16-KP3	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Constructed explanation	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately state that a gas has no fixed shape and no fixed volume, using relevant observation, data or model evidence	matter, solids, liquids, gases, state, gas, has, fixed, shape, volume	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W16-KP4	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Method / model critique	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately compare the three states using a shape-and-volume table, using relevant observation, data or model evidence	matter, solids, liquids, gases, compare, three, states, shape, volume, table	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W17-KP1	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Short response	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately select an appropriate balance for measuring mass, using relevant observation, data or model evidence	matter, measuring, mass, select, appropriate, balance	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W17-KP2	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Diagram / table / graph response	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately read a mass scale with the correct unit, using relevant observation, data or model evidence	matter, measuring, mass, read, scale, correct, unit	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W17-KP3	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Constructed explanation	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately record mass measurements consistently, using relevant observation, data or model evidence	matter, measuring, mass, record, measurements, consistently	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W17-KP4	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Method / model critique	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately evaluate whether a mass measurement method is suitable, using relevant observation, data or model evidence	matter, measuring, mass, evaluate, whether, measurement, method, suitable	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W18-KP1	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Short response	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately select a measuring cylinder or suitable apparatus for volume, using relevant observation, data or model evidence	matter, measuring, volume, select, cylinder, suitable, apparatus	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W18-KP2	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Diagram / table / graph response	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately read liquid volume at the correct scale position, using relevant observation, data or model evidence	matter, measuring, volume, read, liquid, correct, scale, position	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W18-KP3	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Constructed explanation	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately determine volume of a regular or displaced object using provided apparatus at P4 level, using relevant observation, data or model evidence	matter, measuring, volume, determine, regular, displaced, object, provided, apparatus, level	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W18-KP4	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Method / model critique	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately evaluate a volume-measurement setup and suggest one improvement, using relevant observation, data or model evidence	matter, measuring, volume, evaluate, measurement, setup, suggest, one, improvement	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W19-KP1	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Short response	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately classify unfamiliar examples as solid, liquid or gas using shape and volume, using relevant observation, data or model evidence	matter, mastery, classify, unfamiliar, examples, solid, liquid, gas, shape, volume	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W19-KP2	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Diagram / table / graph response	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately interpret mass and volume data without using density, using relevant observation, data or model evidence	matter, mastery, interpret, mass, volume, data, without, density	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W19-KP3	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Constructed explanation	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately correct a model that confuses amount, mass and volume, using relevant observation, data or model evidence	matter, mastery, correct, model, confuses, amount, mass, volume	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W19-KP4	Observe; measure; compare; interpret; evaluate	Curiosity; objectivity	Method / model critique	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Accurately construct an evidence-based explanation that something is matter, using relevant observation, data or model evidence	matter, mastery, construct, evidence, based, explanation, something	P4 boundary: density, particle theory and gas laws are not required	Verified against V7 compliance register
P4-W20-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately identify objects that are sources of light, using relevant observation, data or model evidence	light, sources, seeing, objects, identify	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W20-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately state that a non-luminous object is seen when it reflects light, using relevant observation, data or model evidence	light, sources, seeing, objects, state, non, luminous, object, seen, when	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W20-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately distinguish a light source from an object that only reflects light, using relevant observation, data or model evidence	light, sources, seeing, objects, distinguish, source, object, only, reflects	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W20-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately use a ray-path sketch to explain how an object is seen, using relevant observation, data or model evidence	light, sources, seeing, objects, use, ray, path, sketch, explain, how	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W21-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately state that light travels in straight lines, using relevant observation, data or model evidence	light, travels, straight, lines, state	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W21-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately use aligned holes as evidence that light travels straight, using relevant observation, data or model evidence	light, travels, straight, lines, use, aligned, holes, evidence	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W21-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately predict whether light reaches a screen through a path, using relevant observation, data or model evidence	light, travels, straight, lines, predict, whether, reaches, screen, through, path	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W21-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately correct a diagram showing a bent light path in one medium, using relevant observation, data or model evidence	light, travels, straight, lines, correct, diagram, showing, bent, path, one	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W22-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately state that a shadow forms when light is blocked completely or partially, using relevant observation, data or model evidence	light, shadow, formation, state, forms, when, blocked, completely, partially	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W22-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately identify light source, object, screen and shadow, using relevant observation, data or model evidence	light, shadow, formation, identify, source, object, screen	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W22-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately predict the position of a shadow, using relevant observation, data or model evidence	light, shadow, formation, predict, position	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W22-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately explain shadow formation using straight-line travel of light, using relevant observation, data or model evidence	light, shadow, formation, explain, straight, line, travel	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W23-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately relate shadow shape to object shape and orientation, using relevant observation, data or model evidence	light, shadow, shape, object, position, relate, orientation	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W23-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately predict how moving an object changes shadow position, using relevant observation, data or model evidence	light, shadow, shape, object, position, predict, how, moving, changes	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W23-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately compare shadow evidence from two object positions, using relevant observation, data or model evidence	light, shadow, shape, object, position, compare, evidence, two, positions	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W23-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately design a fair comparison of shadow position, using relevant observation, data or model evidence	light, shadow, shape, object, position, design, fair, comparison	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W24-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately relate shadow size to source-object distance, using relevant observation, data or model evidence	light, shadow, size, variables, relate, source, object, distance	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W24-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately relate shadow size to object-screen distance, using relevant observation, data or model evidence	light, shadow, size, variables, relate, object, screen, distance	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W24-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately interpret shadow-size data from a fair test, using relevant observation, data or model evidence	light, shadow, size, variables, interpret, data, fair, test	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W24-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately identify variables to change, measure and keep the same, using relevant observation, data or model evidence	light, shadow, size, variables, identify, change, measure, keep, same	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W25-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately compare complete and partial blocking of light, using relevant observation, data or model evidence	light, complete, partial, blocking, compare	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W25-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately infer blocking degree from the shadow formed, using relevant observation, data or model evidence	light, complete, partial, blocking, infer, degree, shadow, formed	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W25-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately choose a material for a required light-blocking purpose using evidence, using relevant observation, data or model evidence	light, complete, partial, blocking, choose, material, required, purpose, evidence	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W25-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately explain without requiring transparent, translucent or opaque terminology, using relevant observation, data or model evidence	light, complete, partial, blocking, explain, without, requiring, transparent, translucent, opaque	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W26-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately formulate a testable question about shadows, using relevant observation, data or model evidence	light, investigation, formulate, testable, question, about, shadows	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W26-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately construct a fair shadow investigation, using relevant observation, data or model evidence	light, investigation, construct, fair, shadow	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W26-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately record results in a table or simple graph, using relevant observation, data or model evidence	light, investigation, record, results, table, simple, graph	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W26-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Accurately evaluate whether the evidence supports the conclusion, using relevant observation, data or model evidence	light, investigation, evaluate, whether, evidence, supports, conclusion	P4 boundary: refraction, lenses and quantitative ray calculations are not required	Verified against V7 compliance register
P4-W27-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately identify common sources of heat, using relevant observation, data or model evidence	heat, sources, energy, identify, common	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W27-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that heat is a form of energy, using relevant observation, data or model evidence	heat, sources, energy, state, form	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W27-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately distinguish a heat source from an object warmed by it, using relevant observation, data or model evidence	heat, sources, energy, distinguish, source, object, warmed	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W27-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately explain a familiar heating situation using a heat source, using relevant observation, data or model evidence	heat, sources, energy, explain, familiar, heating, situation, source	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W28-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that temperature measures degree of hotness, using relevant observation, data or model evidence	heat, temperature, measurement, state, measures, degree, hotness	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W28-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately read a thermometer scale correctly, using relevant observation, data or model evidence	heat, temperature, measurement, read, thermometer, scale, correctly	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W28-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately use a datalogger or temperature sensor reading, using relevant observation, data or model evidence	heat, temperature, measurement, use, datalogger, sensor, reading	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W28-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately distinguish temperature from heat, using relevant observation, data or model evidence	heat, temperature, measurement, distinguish	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W29-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that heat flows from hotter to colder regions, using relevant observation, data or model evidence	heat, direction, flow, state, flows, hotter, colder, regions	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W29-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately predict the direction of heat flow between two objects, using relevant observation, data or model evidence	heat, direction, flow, predict, between, two, objects	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W29-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that heat flow continues until both reach the same temperature, using relevant observation, data or model evidence	heat, direction, flow, state, continues, until, both, reach, same, temperature	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W29-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately use temperature data to justify heat-flow direction, using relevant observation, data or model evidence	heat, direction, flow, use, temperature, data, justify	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W30-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately relate heat gain to a temperature increase, using relevant observation, data or model evidence	heat, gain, loss, temperature, relate, increase	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W30-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately relate heat loss to a temperature decrease, using relevant observation, data or model evidence	heat, gain, loss, temperature, relate, decrease	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W30-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately interpret a temperature-time graph, using relevant observation, data or model evidence	heat, gain, loss, temperature, interpret, time, graph	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W30-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately explain a plateau or change using evidence appropriate to P4, using relevant observation, data or model evidence	heat, gain, loss, temperature, explain, plateau, change, evidence, appropriate	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W31-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that solids, liquids and gases may expand when heated, using relevant observation, data or model evidence	heat, expansion, contraction, state, solids, liquids, gases, may, expand, when	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W31-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately state that objects may contract when cooled, using relevant observation, data or model evidence	heat, expansion, contraction, state, objects, may, contract, when, cooled	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W31-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately identify everyday effects of expansion or contraction, using relevant observation, data or model evidence	heat, expansion, contraction, identify, everyday, effects	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W31-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately use before-and-after evidence to infer heat gain or loss, using relevant observation, data or model evidence	heat, expansion, contraction, use, before, after, evidence, infer, gain, loss	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W32-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately recognise melting as an effect of heat gain, using relevant observation, data or model evidence	heat, changes, state, gain, loss, recognise, melting, effect	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W32-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately recognise freezing as an effect of heat loss, using relevant observation, data or model evidence	heat, changes, state, gain, loss, recognise, freezing, effect	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W32-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately distinguish a change of state from expansion, using relevant observation, data or model evidence	heat, changes, state, gain, loss, distinguish, change, expansion	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W32-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately apply heat gain or loss to an everyday state change, using relevant observation, data or model evidence	heat, changes, state, gain, loss, apply, everyday, change	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W33-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately identify metals as generally good conductors of heat, using relevant observation, data or model evidence	heat, conductors, identify, metals, generally, good	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W33-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately identify wood, plastics, air and rubber as poor conductors of heat, using relevant observation, data or model evidence	heat, conductors, identify, wood, plastics, air, rubber, poor	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W33-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately choose a material for a heat-related use, using relevant observation, data or model evidence	heat, conductors, choose, material, related, use	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W33-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately design a fair comparison of heat conduction, using relevant observation, data or model evidence	heat, conductors, design, fair, comparison, conduction	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W34-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately retrieve heat, temperature, flow and material ideas, using relevant observation, data or model evidence	heat, mastery, transfer, retrieve, temperature, flow, material, ideas	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W34-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately apply heat ideas to a multi-step everyday context, using relevant observation, data or model evidence	heat, mastery, transfer, apply, ideas, multi, step, everyday, context	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W34-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately interpret thermometer, table and graph evidence together, using relevant observation, data or model evidence	heat, mastery, transfer, interpret, thermometer, table, graph, evidence, together	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W34-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Accurately evaluate and improve a heat investigation, using relevant observation, data or model evidence	heat, mastery, transfer, evaluate, improve, investigation	P4 boundary: avoid particle theory and rates for specific metals; exact water fixed points are consolidated at P5	Verified against V7 compliance register
P4-W35-KP1	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Short response	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately formulate a testable P4 science question, using relevant observation, data or model evidence	inquiry, mastery, fair, test, design, formulate, testable, science, question	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W35-KP2	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately identify changed, measured and controlled variables, using relevant observation, data or model evidence	inquiry, mastery, fair, test, design, identify, changed, measured, controlled, variables	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W35-KP3	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately choose suitable observations or measurements, using relevant observation, data or model evidence	inquiry, mastery, fair, test, design, choose, suitable, observations, measurements	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W35-KP4	Question; hypothesise; investigate; evaluate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately evaluate whether a proposed test is fair, using relevant observation, data or model evidence	inquiry, mastery, fair, test, design, evaluate, whether, proposed	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W36-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately record P4 observations in a clear table, using relevant observation, data or model evidence	inquiry, mastery, tables, graphs, record, observations, clear, table	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W36-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately read scales and units accurately, using relevant observation, data or model evidence	inquiry, mastery, tables, graphs, read, scales, units, accurately	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W36-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately describe a pattern from a bar or line graph, using relevant observation, data or model evidence	inquiry, mastery, tables, graphs, describe, pattern, bar, line, graph	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W36-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately use graph evidence without extending beyond the data, using relevant observation, data or model evidence	inquiry, mastery, tables, graphs, use, graph, evidence, without, extending, beyond	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W37-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately interpret labelled plant, digestive, light or heat diagrams, using relevant observation, data or model evidence	inquiry, mastery, diagram, model, reasoning, interpret, labelled, plant, digestive, light	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W37-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately identify a missing or incorrect model feature, using relevant observation, data or model evidence	inquiry, mastery, diagram, model, reasoning, identify, missing, incorrect, feature	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W37-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately explain why the feature matters scientifically, using relevant observation, data or model evidence	inquiry, mastery, diagram, model, reasoning, explain, why, feature, matters, scientifically	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W37-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately revise the model using evidence, using relevant observation, data or model evidence	inquiry, mastery, diagram, model, reasoning, revise, evidence	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W38-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately select the relevant P4 topic for a novel situation, using relevant observation, data or model evidence	inquiry, mastery, cross, topic, application, select, relevant, novel, situation	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W38-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately connect two P4 ideas without importing P5 content, using relevant observation, data or model evidence	inquiry, mastery, cross, topic, application, connect, two, ideas, without, importing	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W38-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately support an explanation with observations or data, using relevant observation, data or model evidence	inquiry, mastery, cross, topic, application, support, explanation, observations, data	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W38-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately compare an alternative explanation, using relevant observation, data or model evidence	inquiry, mastery, cross, topic, application, compare, alternative, explanation	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W39-KP1	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Short response	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately distinguish heat from temperature, using relevant observation, data or model evidence	inquiry, mastery, misconception, repair, distinguish, heat, temperature	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W39-KP2	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately distinguish seeing by reflected light from being a light source, using relevant observation, data or model evidence	inquiry, mastery, misconception, repair, distinguish, seeing, reflected, light, being, source	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register

KP ID	Scientific Practice	Values / Attitudes	Suggested Evidence	Retrieval	Success Criteria	Vocabulary	Scope Boundary	Review
P4-W39-KP3	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately distinguish digestion from movement of food, using relevant observation, data or model evidence	inquiry, mastery, misconception, repair, distinguish, digestion, movement, food	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W39-KP4	Observe; infer; explain; apply	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately distinguish P4 plant functions from P5 transport details, using relevant observation, data or model evidence	inquiry, mastery, misconception, repair, distinguish, plant, functions, transport, details	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W40-KP1	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Short response	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately retrieve all P4 core outcomes, using relevant observation, data or model evidence	inquiry, mastery, cumulative, retrieve, all, core, outcomes	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W40-KP2	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Diagram / table / graph response	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately apply P4 knowledge to unfamiliar representations, using relevant observation, data or model evidence	inquiry, mastery, cumulative, apply, knowledge, unfamiliar, representations	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W40-KP3	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Constructed explanation	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately communicate a complete evidence-based explanation, using relevant observation, data or model evidence	inquiry, mastery, cumulative, communicate, complete, evidence, based, explanation	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register
P4-W40-KP4	Interpret; analyse; communicate	Curiosity; objectivity; integrity	Method / model critique	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Accurately evaluate and improve a method, model or conclusion, using relevant observation, data or model evidence	inquiry, mastery, cumulative, evaluate, improve, method, model, conclusion	P4 boundary: explain functions and observable energy effects without later-level anatomy or mechanisms	Verified against V7 compliance register

4. Vertical Progression

Theme / Dimension	Prior prerequisite	Current-level learning	Next-level bridge	Progression logic
Diversity	Living/non-living; classification; materials	Retrieve characteristics and evidence rules	Apply diversity evidence in systems and reproduction	Observable classification -> functional and ecological reasoning
Cycles	Life cycles	Retrieve life cycles only	Reproduction and water cycles	Sequence -> mechanism -> system consequence
Cycles	Life cycles of plants and animals	Matter: mass, volume and three states	Reproduction and water cycle	Observable cycles and states -> continuity and water cycling -> transfer
Interactions	Magnets	Light and heat phenomena	Compare exchanges and system interactions	Direct effects -> interacting factors and causal chains
Energy	Informal effects only	Light and heat	Electrical systems and energy-use responsibility	Observable effects -> functional systems -> energy acquisition and conversion
Practices	Observe, classify, infer	Fair tests, diagrams, tables, simple graphs	Controlled investigations and system models	Increasing independence and evidence quality

5. Spiral Retrieval Map

Level	Level Week	Continuum Week	Theme	Current Topic	Current Focus	Named Retrieval	Practice Link	Learning Stage	Checkpoint Form	Follow-up
P4	1	41	Systems	Plant parts and functions	Plant-system overview	Recent: none; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Observe; infer; explain; apply	Introduce	Short retrieval	Record weak KP ID and schedule retrieval
P4	2	42	Systems	Plant parts and functions	Roots	Recent: P4-W01 to W01; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Question; hypothesise; investigate; evaluate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	3	43	Systems	Plant parts and functions	Stems	Recent: P4-W01 to W02; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Observe; infer; explain; apply	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	4	44	Systems	Plant parts and functions	Leaves	Recent: P4-W02 to W03; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Observe; infer; explain; apply	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	5	45	Systems	Plant parts and functions	Plant-part comparison	Recent: P4-W03 to W04; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Interpret; analyse; communicate	Apply / Consolidate	Transfer checkpoint	Record weak KP ID and schedule retrieval
P4	6	46	Systems	Plant parts and functions	Whole-plant application	Recent: P4-W04 to W05; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Observe; infer; explain; apply	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	7	47	Systems	Plant parts and functions	Plant observation investigation	Recent: P4-W05 to W06; Spaced: first-term build; Prerequisite: P3-W02-KP1; P3-W06-KP1	Question; hypothesise; investigate; evaluate	Master / Transfer	Short retrieval	Record weak KP ID and schedule retrieval
P4	8	48	Systems	Human digestive system	Overview of human body systems	Recent: P4-W06 to W07; Spaced: first-term build; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Introduce	Short retrieval	Record weak KP ID and schedule retrieval
P4	9	49	Systems	Human digestive system	Digestive-system pathway	Recent: P4-W07 to W08; Spaced: P4-W01; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	10	50	Systems	Human digestive system	Mouth and gullet	Recent: P4-W08 to W09; Spaced: P4-W02; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Develop	Cumulative mastery and error analysis	Reassess named KP IDs within 2-4 weeks
P4	11	51	Systems	Human digestive system	Stomach	Recent: P4-W09 to W10; Spaced: P4-W03; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	12	52	Systems	Human digestive system	Small intestine	Recent: P4-W10 to W11; Spaced: P4-W04; Prerequisite: P3-W02-KP2; P3-W03-KP2	Interpret; analyse; communicate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	13	53	Systems	Human digestive system	Large intestine	Recent: P4-W11 to W12; Spaced: P4-W05; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	14	54	Systems	Human digestive system	Integrated digestion	Recent: P4-W12 to W13; Spaced: P4-W06; Prerequisite: P3-W02-KP2; P3-W03-KP2	Observe; infer; explain; apply	Master / Transfer	Short retrieval	Record weak KP ID and schedule retrieval
P4	15	55	Cycles	Matter	What is matter	Recent: P4-W13 to W14; Spaced: P4-W07; Prerequisite: P3-W11-KP1; P3-W16-KP1	Observe; measure; compare; interpret; evaluate	Introduce	Transfer checkpoint	Record weak KP ID and schedule retrieval
P4	16	56	Cycles	Matter	Solids, liquids and gases	Recent: P4-W14 to W15; Spaced: P4-W08; Prerequisite: P3-W11-KP1; P3-W16-KP1	Observe; measure; compare; interpret; evaluate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	17	57	Cycles	Matter	Measuring mass	Recent: P4-W15 to W16; Spaced: P4-W09; Prerequisite: P3-W11-KP1; P3-W16-KP1	Observe; measure; compare; interpret; evaluate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	18	58	Cycles	Matter	Measuring volume	Recent: P4-W16 to W17; Spaced: P4-W10; Prerequisite: P3-W11-KP1; P3-W16-KP1	Observe; measure; compare; interpret; evaluate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	19	59	Cycles	Matter	Matter mastery	Recent: P4-W17 to W18; Spaced: P4-W11; Prerequisite: P3-W11-KP1; P3-W16-KP1	Observe; measure; compare; interpret; evaluate	Master / Transfer	Short retrieval	Record weak KP ID and schedule retrieval
P4	20	60	Energy	Light	Sources of light and seeing objects	Recent: P4-W18 to W19; Spaced: P4-W12; Prerequisite: P3-W11-KP1; P3-W15-KP1	Observe; infer; explain; apply	Introduce	Cumulative mastery and error analysis	Reassess named KP IDs within 2-4 weeks
P4	21	61	Energy	Light	Light travels in straight lines	Recent: P4-W19 to W20; Spaced: P4-W13; Prerequisite: P3-W11-KP1; P3-W15-KP1	Interpret; analyse; communicate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	22	62	Energy	Light	Shadow formation	Recent: P4-W20 to W21; Spaced: P4-W14; Prerequisite: P3-W11-KP1; P3-W15-KP1	Observe; infer; explain; apply	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	23	63	Energy	Light	Shadow shape and object position	Recent: P4-W21 to W22; Spaced: P4-W15; Prerequisite: P3-W11-KP1; P3-W15-KP1	Question; hypothesise; investigate; evaluate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	24	64	Energy	Light	Shadow size variables	Recent: P4-W22 to W23; Spaced: P4-W16; Prerequisite: P3-W11-KP1; P3-W15-KP1	Question; hypothesise; investigate; evaluate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	25	65	Energy	Light	Complete and partial blocking	Recent: P4-W23 to W24; Spaced: P4-W17; Prerequisite: P3-W11-KP1; P3-W15-KP1	Interpret; analyse; communicate	Apply / Consolidate	Transfer checkpoint	Record weak KP ID and schedule retrieval
P4	26	66	Energy	Light	Light investigation	Recent: P4-W24 to W25; Spaced: P4-W18; Prerequisite: P3-W11-KP1; P3-W15-KP1	Question; hypothesise; investigate; evaluate	Master / Transfer	Short retrieval	Record weak KP ID and schedule retrieval
P4	27	67	Energy	Heat	Heat sources and heat as energy	Recent: P4-W25 to W26; Spaced: P4-W19; Prerequisite: P3-W11-KP1; P3-W12-KP1	Observe; infer; explain; apply	Introduce	Short retrieval	Record weak KP ID and schedule retrieval
P4	28	68	Energy	Heat	Temperature and measurement	Recent: P4-W26 to W27; Spaced: P4-W20; Prerequisite: P3-W11-KP1; P3-W12-KP1	Question; hypothesise; investigate; evaluate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	29	69	Energy	Heat	Direction of heat flow	Recent: P4-W27 to W28; Spaced: P4-W21; Prerequisite: P3-W11-KP1; P3-W12-KP1	Interpret; analyse; communicate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	30	70	Energy	Heat	Heat gain, heat loss and temperature	Recent: P4-W28 to W29; Spaced: P4-W22; Prerequisite: P3-W11-KP1; P3-W12-KP1	Interpret; analyse; communicate	Develop	Cumulative mastery and error analysis	Reassess named KP IDs within 2-4 weeks
P4	31	71	Energy	Heat	Expansion and contraction	Recent: P4-W29 to W30; Spaced: P4-W23; Prerequisite: P3-W11-KP1; P3-W12-KP1	Interpret; analyse; communicate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	32	72	Energy	Heat	Changes of state from heat gain or loss	Recent: P4-W30 to W31; Spaced: P4-W24; Prerequisite: P3-W11-KP1; P3-W12-KP1	Observe; infer; explain; apply	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	33	73	Energy	Heat	Conductors of heat	Recent: P4-W31 to W32; Spaced: P4-W25; Prerequisite: P3-W11-KP1; P3-W12-KP1	Question; hypothesise; investigate; evaluate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	34	74	Energy	Heat	Heat mastery and P4 transfer	Recent: P4-W32 to W33; Spaced: P4-W26; Prerequisite: P3-W11-KP1; P3-W12-KP1	Question; hypothesise; investigate; evaluate	Master / Transfer	Short retrieval	Record weak KP ID and schedule retrieval

Level	Level Week	Continuum Week	Theme	Current Topic	Current Focus	Named Retrieval	Practice Link	Learning Stage	Checkpoint Form	Follow-up
P4	35	75	Integration	P4 inquiry and mastery	Fair-test design	Recent: P4-W33 to W34; Spaced: P4-W27; Prerequisite: P3-W10-KP4; P3-W20-KP4	Question; hypothesise; investigate; evaluate	Introduce	Transfer checkpoint	Record weak KP ID and schedule retrieval
P4	36	76	Integration	P4 inquiry and mastery	Tables and graphs	Recent: P4-W34 to W35; Spaced: P4-W28; Prerequisite: P3-W10-KP4; P3-W20-KP4	Interpret; analyse; communicate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	37	77	Integration	P4 inquiry and mastery	Diagram and model reasoning	Recent: P4-W35 to W36; Spaced: P4-W29; Prerequisite: P3-W10-KP4; P3-W20-KP4	Interpret; analyse; communicate	Develop	Short retrieval	Record weak KP ID and schedule retrieval
P4	38	78	Integration	P4 inquiry and mastery	Cross-topic application	Recent: P4-W36 to W37; Spaced: P4-W30; Prerequisite: P3-W10-KP4; P3-W20-KP4	Interpret; analyse; communicate	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	39	79	Integration	P4 inquiry and mastery	Misconception repair	Recent: P4-W37 to W38; Spaced: P4-W31; Prerequisite: P3-W10-KP4; P3-W20-KP4	Observe; infer; explain; apply	Apply / Consolidate	Short retrieval	Record weak KP ID and schedule retrieval
P4	40	80	Integration	P4 inquiry and mastery	P4 cumulative mastery	Recent: P4-W38 to W39; Spaced: P4-W32; Prerequisite: P3-W10-KP4; P3-W20-KP4	Interpret; analyse; communicate	Master / Transfer	Cumulative mastery and error analysis	Reassess named KP IDs within 2-4 weeks

6. MOE Coverage Audit

Level	Theme	MOE Topic / Outcome Block	First KP	Last KP	Status	Scope / Evidence Note
P4	Systems	Plant parts and functions	P4-W01-KP1	P4-W07-KP4	Covered	Transport tubes and photosynthesis requirements deferred
P4	Systems	Human digestive system parts, functions and digestion	P4-W08-KP1	P4-W14-KP4	Covered	Detailed enzymes/villi excluded
P4	Cycles	Matter has mass and occupies space; solids, liquids and gases	P4-W15-KP1	P4-W16-KP4	Covered	Density and particle theory excluded
P4	Cycles	Measure mass and volume using appropriate apparatus	P4-W17-KP1	P4-W19-KP4	Covered	Scale reading, apparatus and evidence
P4	Energy	Light travels in straight lines; shadows; reflection and uses	P4-W20-KP1	P4-W26-KP4	Covered	Evidence and model work included
P4	Energy	Heat sources; heat vs temperature; hotter-to-colder flow	P4-W27-KP1	P4-W31-KP4	Covered	Measurement practice included
P4	Energy	Expansion/contraction, state change and conductors of heat	P4-W31-KP1	P4-W34-KP4	Covered	Specific material transfer rates excluded
P4	Integration	P4 scientific inquiry, models, data and cumulative mastery	P4-W35-KP1	P4-W40-KP4	Covered	Cross-topic transfer within P4 boundaries

7. Assessment Blueprint

Rule	Requirement	Audit Check
Knowledge mix	65% current / 20% recent / 15% spaced	Name every source KP ID
Visual/data	At least 30% of marks	Use answer-relevant diagrams, tables, graphs, models or setups
Constructed response	At least 40% of marks	Require explaining, predicting, justifying, critiquing or improving
Scientific inquiry	At least two practices per paper	Include variables, fair test, data or method evaluation
Advanced demand	Depth without premature content	Use unfamiliar contexts, competing evidence and model revision
Mastery	Internal guide: 80%+ secure; 60-79% developing; below 60% reteach	Judge relevant core KPs, not total score only
Follow-up	Retrieve weak KP in 2-4 weeks	Use matched but non-identical evidence
Scope	Later-level content is not required early	Extensions must be labelled and never replace core mastery

8. Sources and Governance

Type	Source / Rule	URL / Basis	Use	Status
Primary official source	MOE Science Teaching & Learning Syllabus, Primary (2023)	https://www.moe.gov.sg/-/media/files/primary/syllabus/2023-primary-science.pdf	P3-P6 topics, learning outcomes, practices, values and notes	Reviewed for V5
Assessment reference	SEAB 2026 PSLE Science Syllabus	https://www.seab.gov.sg/files/PSLE%20Syllabus%20documents/2026%20PSLE/0009_y26_sy.pdf	Assessment objectives and visual/data representations	Reviewed
Governance	Master matrix precedes level KP lists	Internal PSLE Checkpoint rule	P3/P4/P5/P6 KP lists must be filtered from this master	Authoritative
V4 foundation	P4/P5 boundaries rebuilt	Deep review finding	Moved Reproduction and Water to P5; removed P4 human reproduction	Retained
V5 correction	P5 Water completeness	Final review finding	Added importance to life processes and water-pollution impact	Completed
V7 correction	Compliance-first rebuild and prerequisite correction	MOE Primary Science Syllabus 2023	P4 Matter restored; P6 sequence corrected; topic-based stages applied	Verified against compliance register
Derivation record	Grade KP list generated from V7 Master Matrix	D:/Work & Company/XIN Technology/PSLE Checkpoint/Science/Primary_3_to_Primary_6_Science_Complete_Yearly_Master_Matrix_V7_MOE_2023.xlsx	Weekly, atomic, progression, spiral and outcome-level coverage records retained without rewriting	Verified during export