

# Science 9 Workbook Map

Student learning objectives	Homework task	Practical	Revision tasks	Quizzes
Introduction to science				
<b>Lab safety</b> 1A State rules for safe behaviour in the laboratory Explain the potential dangers of unsafe behaviour Suggest appropriate responses after common laboratory accidents.	1.01 Safety first		<a href="#">1A 101 Laboratory safety reasons</a> 1A 201 Being responsible in the laboratory	<a href="#">1A 1 Safety rules</a> 1A 2 What should you do next?
<b>Lab equipment</b> 1 B Name common pieces of laboratory equipment and state what each one is used for. Draw accurate scientific diagrams using outline symbols. Select the appropriate equipment for a given task. Identify the parts of a Bunsen burner. Explain how to change the colour of a Bunsen flame. Light and use a Bunsen burner correctly. Draw a diagram to show the appearance of a gas tap that is on, and one that is off. Test tube; beaker, conical flask, measuring cylinder, gauze mat, Bunsen burner, tripod, evaporating dish, test tube holder, tongs, funnel, barrel, air hole, gas tube, base.	1.02 Tools of the lab 1.03 Scientific drawings 1.04 The Bunsen burner	1B 1 Lighting a Bunsen burner 1B 2 Using a Bunsen burner to heat materials in a test tube.	1B 101 Outline drawings of equipment 1B 102 Recognising laboratory equipment 1B 103 Equipment word search 1B 104 Naming and using laboratory equipment 1B 201 Label and use Bunsen burner 1B 301 Using a Bunsen burner 1B 302 Bunsen burner true/false	1B 1a Drawing equipment 1B 1b Using equipment 1B 1c Identifying equipment 1B 2 Labelling a Bunsen burner 1B 3 Lighting a Bunsen burner

<p><b>Scientific skills</b></p> <p>1C Take accurate readings using different types of scales.</p> <p>Measure volume accurately by taking the reading at the bottom of the meniscus.</p> <p>Select the appropriate instrument for specific measuring tasks.</p> <p>Use the SI system of units and measurements correctly.</p> <p>Meniscus, measuring cylinder, ruler, stopwatch, balance, volume, distance, time, mass.</p>	<p>1.05 Reading scales</p>	<p>1C 1 Measurement</p>	<p>1C 101 Reading scales 1C 201 Reading volume 1C 301 Measurement Flipcards</p>	<p>1C 1 Reading scales 1C 2 Reading volume 1C 3 Measuring instrument and units</p>
<p><b>Branches of science</b></p> <p>1D Name four branches of science and what each one studies...</p>	<p>1.05 Famous scientists* 1.07 Etymology</p>		<p>1D 101 Branches of science 1D 102 What scientists know</p>	<p>1D 1 Which science?</p>
<p><b>Scientific experiments</b></p> <p>1E Identify the principles of Fair Testing when explaining the validity of simple experiments from everyday life.</p> <p>For simple scientific investigations:</p> <ul style="list-style-type: none"> <li>– identify the dependant and independent variables</li> <li>– state at least 3 other variables that need to be controlled</li> <li>– describe a suitable control experiment (where applicable)</li> <li>– explain the importance of repetition when carrying out Fair Tests.</li> </ul> <p>Plot accurate, labelled line graphs.</p> <p>Interpret trends from a line graph.</p> <p>Present data in table form and use tables to obtain information.</p> <p>Write up practical work under the headings <b>Aim, Method, Results</b> and <b>Conclusion</b>.</p>	<p>1.08 Fair tests <a href="#">1.09 Bouncing balls</a> 1.10 Scientific investigations 1.11 Plotting line graphs 1.12 Experiment words</p>	<p><a href="#">1E 1 Flame colour</a></p>	<p>1E 101 Fair test key facts 1E 201 Dependent and independent variables 1E 202 Fair testing 1E 301 Introduction to graphing</p>	<p>1E 1 Fair testing 1E 2 Fair testing including variables</p>

<b>Air, Water and Combustion</b>				
<p><b>Common gases</b></p> <p>2A List the 3 main gases (N<sub>2</sub>, O<sub>2</sub>, Ar) present in air and their approximate proportions.</p> <p>State the formula, properties and a use for each of these gases: argon, nitrogen, helium and methane.</p> <p>State the formula, properties, laboratory test for and a use of:</p> <ul style="list-style-type: none"> <li>- carbon dioxide</li> <li>- oxygen</li> <li>- hydrogen</li> </ul>	<p>2.01 The air we breathe</p> <p>2.02 Information hunt</p>	<p>2A 1 Testing for oxygen</p> <p>2A 2 Testing for hydrogen</p> <p>2A 3 Testing for carbon dioxide</p>	<p>2A 101 Percentage of gases in air</p> <p>2A 102 Formulae for gases</p> <p>2A 103 Gases formulae</p> <p>2A 201 Gases tests</p> <p>2A 202 Gases facts</p>	<p>2A 1 Gases formulae</p> <p>2A 2 Tests for gases</p> <p>2A 3 Gases tests and facts</p>
<p><b>Water</b></p> <p>2B Describe a simple investigation to show that water vapour is present in air.</p> <p>State that water is a compound composed of hydrogen and oxygen and write the formula for water.</p> <p>Use cobalt chloride paper to identify water.</p> <p>Write a word equation for the combustion of hydrogen.</p>	<p>2.03 A closer look at water</p>	<p>2B 1 Testing for water</p> <p>2B 2 Electrolysis of water</p>	<p>2B 101 Water</p>	<p>2B 1 Water</p>

<p><b>Combustion</b></p> <p>2C State that combustion occurs when substances react with oxygen.</p> <p>Interpret experimental investigations into combustion of a hydrocarbon fuel (methane, propane or a candle).</p> <p>Write a word equation for the complete combustion of a hydrocarbon.</p> <p>Explain the dangers associated with burning hydrocarbon fuels in a limited supply of air.</p> <p>State the three things fire needs in order to burn.</p> <p>Explain why a carbon dioxide fire extinguisher can put out fires.</p> <p>Explain the dangers associated with using water to put out some fires.</p> <p>Describe appropriate responses when very small fires occur in the laboratory.</p> <p>Count atoms in the formulae used in this unit.</p>	<p>2.04 Combustion gases</p> <p>2.05 Poisoned by gas</p> <p>2.06 Formulae</p> <p>2.07 Help -- Fire!</p> <p>2.08 Common gases</p>	<p>2C 1a Burning a candle floating in water</p> <p>2C 1b Burning a candle under a large beaker</p> <p>2C 2 Properties of carbon dioxide</p> <p>2C 3 Putting out fires</p>	<p>2C 101 Combustion</p> <p>2C 301 Counting atoms</p>	<p>2C 1 Combustion</p> <p>2C 2 Putting out fires</p> <p>2C 3 Counting atoms</p>
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<b>The nature of matter</b>				
<p><b>Solids, liquids and gases</b></p> <p>3A Identify the three states of matter and classify common substances as solid, liquid or gas.</p> <p>State the characteristic properties of matter in each state: compressibility, shape and ability to diffuse.</p> <p>Draw diagrams to show the arrangement of particles in each state.</p> <p>Explain results of practical investigations in terms of particles and how they behave.</p> <p>Apply an understanding of the characteristics of different states of matter to everyday examples.</p>	<p><a href="#">3.01 State the state</a>  <a href="#">3.02 How do we know?</a>  3.03 Particle sentences  3.04 Particle-y useful  3.05 Balloon science</p>	<p>3A 1 Compression  3A 2 Diffusion of gases  3A 3 Diffusion of liquids</p>	<p>3A 101 What state?  3A 102 Matter properties  3A 103 Matter properties quiz  3A 201 Particles in matter</p>	<p>3A 1 States of matter 1  3A 2 States of matter 2</p>
<p><b>Density</b></p> <p>3B Determine the density of small solids by measuring their mass and volume (by displacement of water), then calculating the density using a formula.</p> <p>State that an object will float if its density is less than that of the liquid it is in, and sink if it is more dense.</p> <p>Estimate the densities of objects using information about the densities of liquids in which they float or sink.</p> <p>Draw a diagram to show the arrangement of particles in substances of high or low densities.</p>	<p><a href="#">3.06 Density</a>  <a href="#">3.07 Four flasks</a></p>	<p><a href="#">3B 1 Determining density</a>  <a href="#">3B 2 Using density to identify plastics</a></p>	<p>3B 101 Density 1  3B 102 Density calculation</p>	<p>3B 1 Density and particles</p>

<p><b>Effect of heat on particles</b></p> <p>3C State that particles move more quickly when the temperature is increased.</p> <p>State that particles move further apart when the temperature is increased.</p> <p>Explain convection in terms of the densities of warm and cold air or water</p> <p>Apply the expansion and contraction of solids, liquids or gases to everyday situations.</p> <p>Explain how a thermometer works.</p>	<p>3.08 But <i>which</i> thermometer?</p> <p>3.09 Hot air</p> <p>3.10 Experimental proof</p>	<p>3C 1 Heating and cooling air</p> <p>3C 2 Cooling liquids</p> <p>3C 3 Heating and cooling solids</p> <p>3C 4 Convection</p>	<p>3C 101 Particles and heat</p>	<p>3C 1 Heat and particles</p>
<p><b>Changes of state</b></p> <p>3D Use the terms <i>boiling, melting, freezing, condensing, sublimation</i> and <i>reverse sublimation</i> to describe changes of state.</p> <p>State whether energy is absorbed or released during specific changes of state.</p> <p>Name the changes that occur during various points in the water cycle.</p> <p>State the freezing point and boiling point of water.</p> <p>Interpret a graph showing how temperature changes through changes of state and use it to determine the freezing point or boiling point of substances other than water.</p> <p>Discuss practical applications of changes of state such as how sweat helps cool the body and why steam causes a bad burn.</p>	<p>3.11 Heating and cooling</p> <p>3.12 The water cycle</p> <p>3.13 Hot metal</p> <p>3.14 Energy in or out?</p> <p>3.15 Wet and dry bulb thermometers</p>	<p>3D 1 A heating curve for water</p>	<p>3D 101 Changes of state</p> <p>3D 102 Water changing states</p> <p>3D 103 Energy in or out?</p> <p>3D 104 States and heat</p> <p>3D Matter revision flipcards</p>	<p>3D 1a Changes of state</p> <p>3D 1b Changes of state</p> <p>3D 2 The nature of matter – revision</p>

Laboratory techniques				
<p><b>Solutions</b></p> <p>4A Draw a diagram to show what happens when a solid dissolves in a liquid.</p> <p>Explain the difference between dissolving and melting.</p> <p>Use the terms <i>solution</i>, <i>solute</i> and <i>solvent</i> correctly.</p> <p>Explain what a <i>saturated</i> solution is, and how it can be distinguished from an unsaturated solution.</p> <p>Describe how to grow large crystals of a compound.</p> <p>Use the terms <i>soluble</i> and <i>insoluble</i> when describing solids, and the terms <i>miscible</i> and <i>immiscible</i> when describing liquids.</p> <p>State that solutions are always clear, and that liquids which are cloudy contain suspended particles.</p>	<p>4.01 Particles in solution</p> <p>4.02 Solution words</p> <p>4.03 Production of salt at Grassmere</p> <p>4.04 Growing crystals</p>	<p>4A 1 Soluble or insoluble?</p> <p>4A 2 Growing crystals</p>	<p>4A 101 Solution words</p> <p><a href="#">4A 102 Solution words</a></p> <p>4A 103 Soluble and insoluble</p> <p>4A 104 Particles</p> <p><a href="#">4A Solutions revision flipcards</a></p>	<p><a href="#">4A 1 Solutions</a></p>

<p><b>Separation techniques</b></p> <p>4B For the following separation techniques, name the technique from a diagram or description of it and briefly explain how it works to separate the mixture.</p> <ul style="list-style-type: none"> <li>– filtering</li> <li>– evaporation</li> <li>– crystallisation</li> <li>– chromatography</li> <li>– distillation</li> <li>– decanting</li> <li>– magnetism</li> </ul> <p>Identify separation techniques used in everyday life or in industrial applications.</p> <p>Suggest suitable methods of separating mixtures containing two or three substances.</p> <p>Link the properties of different substances to separation methods used in their purification.</p> <p>Filter, filtrate, residue</p>	<p>4.05 Matching properties</p> <p><a href="#">4.06 Separation techniques</a></p> <p>4.07 Extraction of manuka oil</p> <p>4.08 Beeswax</p>	<p><a href="#">4B 1 Separating sand and salt</a></p> <p><a href="#">4B 2 Chromatography</a></p> <p>4B 3 Getting fresh water from a solution: distillation</p>	<p>4B 101 Separation techniques</p> <p>4B 102 Separation memory</p> <p>4B 103 Separation words</p> <p>4B 104 Properties for separating</p> <p>4B 105 Separation</p> <p>4B 201 Separating salt and water</p> <p>4B 202 Separating sugar and spice</p>	<p>4B 1 Separation techniques</p> <p>4B 2 Separating examples sand and copper sulfate</p>
<p><b>Elements, compounds and mixtures</b></p> <p>5A Define the terms <i>element</i>, <i>compound</i> and <i>mixture</i> in terms of their composition and in terms of whether they can be broken down or separated into simpler substances.</p> <p>Identify elements, compounds and mixtures from diagrams representing their particles.</p> <p>Classify common substances as element, compound or mixture.</p>	<p>5.01 Pure substance or mixture?</p> <p>5.02 Element, compound or mixture?</p>		<p>5A 101 Substances key facts</p> <p>5A 102 Classifying substances</p> <p>5A 103 Classifying substances (pictures)</p>	<p>5A 1 Substances key facts</p> <p><a href="#">5A 2 Types of particles</a></p>

<p><b>Metallic and non-metallic elements</b></p> <p>5B List the characteristic properties of metals and non-metals.</p> <p>Determine whether an unknown substance is a metal or a non-metal by considering its physical properties.</p> <p>State that the elements are listed together on the periodic table, with the metals on the left and the non-metals on the right.</p> <p>State the name, chemical symbol, properties and uses of the common elements: (H, He, O, N, Ar) C, Ne, Mg, Al, S, Cl, Ca, Fe, Cu, Zn, Ag, I, Au, Pb.</p> <p>Link the properties of the elements to their uses.</p> <p>State that an atom is the smallest part of an element.</p>	<p>5.03 Elementary questions</p> <p>5.04 Metal or non-metal?</p> <p>5.05 Elementary mistakes</p> <p>5.06 Elements and their uses</p> <p>5.07 Phone Phun</p> <p>5.08 Properties problems</p>	<p>5B 1 Metal or non-metal?</p>	<p>5B 101 Metal or non-metal</p> <p>5B 102 Periodic table facts</p> <p>5B 201 Formulae for elements</p> <p>5B 203 Formulae for common substances</p> <p>5B 301 Identifying elements from symbols</p> <p>5B 401 Properties of elements</p> <p>5B 402 Metal properties</p> <p>5B 403 Properties of common substances</p>	<p>5B 1 Metals and non-metals</p> <p>5B 2 Elements – write symbols</p> <p>5B 3 Elements – write names</p> <p>5B 4 Element properties and uses</p>
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<p><b>Compounds</b></p> <p>5C State that when elements combine chemically they form compounds whose properties are different from their constituent elements.</p> <p>State the name and chemical formula and characteristics of the compounds (water, carbon dioxide, methane), sodium chloride, magnesium oxide, iron sulfide, copper sulfate, sugar (sucrose).</p> <p>State that a molecule is composed of two or more atoms, chemically combined, while a compound is composed of two or more different kinds of atoms chemically combined.</p> <p>Distinguish between elements and compounds based on their chemical formulae.</p> <p>Count atoms in the chemical formulae used during this unit.</p>	<p>5.09 Common formulae (2.06 Formulae)</p>	<p>5C 1 Magnesium and oxygen</p> <p>5C 2a Iron and sulfur 1</p> <p>5C 2b Iron and sulfur 2: the singing test tube</p> <p>5C 3 Electrolysis of copper chloride</p>	<p>5C 101 Naming compounds</p> <p>5C 102 Compounds key facts</p> <p>5C 201 Counting atoms</p> <p>5C Formula revision flipcards</p>	<p>5C 1 Write formulae</p> <p>5C 2 Counting atoms</p> <p>5C 3 Identifying common substances</p>
<p><b>6A Under the microscope</b></p> <p>Name the parts of a monocular microscope, stating the function of each part, and use it correctly on both low and high power.</p> <p>Prepare a wet mount slide for viewing under a microscope.</p> <p>State that living things are made of cells.</p> <p>Distinguish between plant and animal cells when seen under a microscope.</p> <p>Label the major parts of plant and animal cells and state the function of each part.</p> <p>Microscope parts: eye piece lens, barrel, optical lens, stage, base, high and low power adjustment, slide, cover slip, cell membrane, cell wall, cytoplasm, nucleus, chloroplasts, vacuole.</p>	<p>6.01 The parts of a microscope</p> <p>6.02 Cells</p>	<p>6A 1 Using a microscope</p> <p>6A 2 Onion cells under a microscope</p>	<p><a href="#">6A 101 The parts of a plant cell (drag and drop)</a></p> <p>6A 102 The parts of a plant cell (hangman)</p> <p>6A 103 Plant and animal cells</p>	<p>6A 1a Plants and animal cells</p> <p><a href="#">6A 1b The parts of a cell</a></p>

<p><b>6B Introduction to plants.</b></p> <p>List at least 8 different ways in which humans use plants (include Maori uses).</p> <p>Identify the major parts of a plant and state the function of each part.</p> <p>Roots, leaf, stem, flowers, seeds, leaf veins,</p>	<p><b>6.03 Research assignment -- a native plant</b></p> <p><b>6.04 The parts of a plant</b></p>		<p>6B 101 Plant parts and function 1</p> <p>6B 102 Plants, parts and function 2</p>	<p>6B 1 Plants structure</p>
<p><b>6C Leaves and photosynthesis</b></p> <p>State that plants use sunlight to make food by a process called photosynthesis.</p> <p>Write the word equation for photosynthesis.</p> <p>Label a diagram of the structure of a leaf and state the function of each part.</p> <p>Describe how the typical plant leaf is adapted for photosynthesis i.e. surface area, shape, and arrangement of cells.</p> <p>Describe the method used to test a leaf for starch.</p> <p>Interpret the results of controlled experiments into the conditions necessary for photosynthesis.</p> <p>Explain the importance of the process of respiration to living things.</p> <p>Leaf structure; epidermis, palisade, and spongy layer and stomata chloroplasts guard cells, air space, xylem and phloem.</p> <p>Chlorophyll, iodine, photosynthesis, starch, glucose</p>	<p><a href="#">6.05 Photosynthesis</a></p> <p><b>6.06 Tree bags</b></p> <p><b>6.07 Opposite processes</b></p> <p><b>6.08 Cells and leaf structure</b></p>	<p><b>6C 1 Photosynthesis 1: sunlight and chlorophyll</b></p> <p><b>6C 2 Photosynthesis 2: carbon dioxide</b></p> <p><a href="#">6C 3 Photosynthesis 3: oxygen</a></p>	<p>6C 101 The structure of a leaf (drag and drop)</p> <p>6C 102 The structure of a leaf (hangman)</p> <p>6C 103 Leaf name and function</p> <p>6C 104 The leaf structure and function</p> <p>6C 201 Photosynthesis 1</p> <p>6C 202 Photosynthesis 2</p> <p>6C Plant structures revision</p>	<p>6C 1a Leaf structure</p> <p>6C 1b Leaf structure and function</p> <p>6C 2 Photosynthesis</p>

<p><b>6D Plants and water</b></p> <p>Define osmosis as the movement of water across a semi-permeable membrane from a region of high water concentration to low water concentration.</p> <p>Interpret simple investigations into osmosis and transpiration.</p> <p>Describe transpiration: how water enters plants through the root hairs, is transported through the xylem and lost through stomata in the leaves.</p> <p>Describe the role of the phloem in the transport of sugars from the leaf to the roots and other areas that require or store glucose.</p> <p>Transpiration Phloem, xylem, osmosis, semi-permeable membrane, root hairs</p>	<p>6.09 Osmosis experiments 6.10 Transporting water 6.11 Explanations please (plants) 6.12 Leaf true or false</p>	<p><a href="#">6D 1 Osmosis</a></p> <p>6D 2a Transpiration 6D 2b Movement of water through celery</p>	<p>6D 101 Plant processes 6D 102 Plant processes quiz</p>	<p>6D 1 Plants and water</p>
<p><b>Sexual reproduction in plants</b></p> <p><b>7A Seeds</b></p> <p>Identify the parts of a seed and state the function of each part.</p> <p>Describe the changes that take place as a seed germinates.</p> <p>Perform an experiment to determine the conditions necessary for germination and recall the results of this experiment.</p> <p>Seed: testa, micropyle, cotyledons, radicle plumule, Flower: Sepal, petal, stigma, style, ovary, ovule, anther, filament, pollen, self-pollination, cross-pollination, stamen, pistil.</p>	<p>7.01 Inside a seed 7.02 Bean sprouts 7.03 A seedy problem</p>	<p>7A 1 The changes occurring during germination 7A 2 The conditions required for germination</p>	<p>7A 101 Bean seed 7A 102 Bean seed 7A 201 Germination</p>	<p>7A 1a Bean seed 7A 1b Seed structure 7A 2 Seed germination</p>

<p><b>7B Flowers &amp; fruit</b></p> <p>Dissect and draw a diagram of a flower.</p> <p>Label the male and female parts of a flower and state their function.</p> <p>Classify characteristics of flowers as being for wind pollination or animal pollination.</p> <p>Describe the steps that are involved in: pollination (cross and self pollination), fertilisation, and fruit development.</p> <p>Identify seed dispersal methods (wind, water, explosion, hooks and making the fruit attractive for animals to eat) and explain the function of seed dispersal.</p> <p>Compare and contrast pollination and dispersal.</p> <p>Processes: pollination (self and cross), fertilisation, sexual reproduction, germination, dispersal,</p>	<p>7.04 The parts of a flower</p> <p>7.05 Pollination types</p> <p>7.06 Room to grow</p> <p>7.07 The life cycle of a plant</p> <p><a href="#">7.08 Differences</a></p>	<p>7B 1 Flowers</p> <p>7B 2 Fruit</p>	<p>7B 101 The parts of a flower (drag and drop)</p> <p><a href="#">7B 102 The parts of a flower (text)</a></p> <p>7B 103 Flowers male and female</p> <p>7B 104 Flower functions 1</p> <p>7B 105 Flower functions</p> <p>7B 201 Pollination</p> <p><a href="#">7B 301 Seeds dispersal</a></p> <p>7B Plant reproduction revision flip</p> <p>7B Plant reproduction revision crossword</p>	<p>7B 1a Flower naming</p> <p><a href="#">7B 1b Flower structure and function</a></p> <p>7B 2 Pollination</p> <p>7B 3 Seed dispersal</p>
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<p><b>8A Food</b></p> <p>List the main classes of food, and their functions in the body; proteins, lipids, carbohydrates, vitamins, and minerals.</p> <p>Give examples of food rich in starch, sugar, protein and fat.</p> <p>Give examples of essential vitamins and minerals and the diseases caused by their absence from the diet.</p> <p>Describe how to carry out and name the chemical tests for the food groups: proteins, simple sugars and starch and fats.</p> <p>State that a good diet involves eating the right variety and the right amount of food and discuss the possible consequences of a bad diet.</p> <p>Food groups; carbohydrates, starch, sugar, protein, fats, vitamins, minerals, deficiency disease, Benedict solution,</p>	<p><b>8.01 First food words</b></p> <p><b>8.02 Testing food</b></p> <p><b>8.03 A healthy lunch</b></p> <p><b>8.04 Food fit for a kakapo</b></p> <p><b>8.05 Vital factors</b></p> <p><b>8.06 Special needs*</b></p> <p><b>8.07 Nutritional content of foods</b></p>	<p><b>8A 1a Testing for starch</b></p> <p><b>8A 1b Testing for glucose (a kind of sugar)</b></p> <p><b>8A 1c Testing for protein</b></p> <p><b>8A 1d A test for fat</b></p> <p><b>8A 2 Testing foods</b></p>	<p>8A 101 Food groups</p> <p>8A 102 Food groups quiz</p> <p>8A 201 Food tests</p> <p>8A 202 Food tests memory</p> <p>8A 301 Classifying food</p> <p>8A 401 Vitamins and minerals</p>	<p>8A 1 Food groups</p> <p>8A 2 Food tests</p> <p>8A 3 Classifying foods</p> <p>8A 4 Vitamins and minerals</p>
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<p><b>8 B Digestion</b></p> <p>Label a diagram of the human digestive system and state what is happening in each area.</p> <p>Recall the various types of teeth and how a mammal's teeth are adapted to suit their diets (herbivores, and carnivores).</p> <p>Explain that the main job of the digestive system is to process the food we eat so that it can get to the cells of the body.</p> <p>Explain that food molecules are too large to cross a membrane and that enzymes help to break them into smaller molecules.</p> <p>Distinguish between the following terms: ingestion, digestion, absorption, egestion with regard to the alimentary canal.</p> <p>Discuss the role of the senses in finding and catching food.</p> <p>Digestive system; mouth, salivary gland, teeth, (incisors, canines, molars,) oesophagus, stomach, small intestine, villi, pancreas, gall bladder, liver, appendix, anus, enzymes, binocular vision.</p>	<p><b>8.08 The digestive system</b> <b>8.09 A digestive mup-ix</b></p>	<p><b>8B 1 The properties of glucose and starch</b></p>	<p>8B 101 Teeth 8B 102 Mouth and teeth in digestion 8B 201 Digestive system (drag and drop) <a href="#">8B Digestive system (hangman)</a> 8B 301 Digestive system name and function 8B 302 Digestive system function 8B 303 Digestive system 8B Digestion revision 8B Food and digestion revision flip</p>	<p>8B 1 Mouth and teeth in digestion <a href="#">8B 2 Digestive system names</a> <a href="#">8B 3 Digestive system – functions</a></p>
<p><b>9 Communities</b></p> <p><b>9A Living things</b></p> <p>Distinguish between living and non-living things.</p> <p>Recall the characteristics of living things. (MRS GREN)</p> <p>Movement, respiration, sensitivity, growth, reproduction, excretion, nutrition, living, non-living</p>	<p><b>9.01 Mrs Who?</b></p>		<p>9A 101 Living things 9A 102 Living things 9A 103 MRS GREN 9A 104 Living or non-living</p>	<p>9A 1 Living or non-living</p>

<p><b>9B Classification</b></p> <p>Identify organisms using simple dichotomous keys.</p> <p>Using information from a key to describe an organism.</p> <p>Name at least 3 major groups within the plant kingdom, and at least 4 major groups within the animal kingdom.</p> <p>Plant, animal, vertebrate, invertebrate, birds, mammals, fish, arthropod, mollusc, worm, reptile, amphibian, mosses, ferns, conifers, flowering plants, monocotyledons, dicotyledons.</p>	<p>9.02 Classification</p> <p>9.03 Bird identification</p>	<p>9B 1 Classification of plants</p>	<p>9B 101 Classification of animals</p> <p>9B 102 What animal group?</p> <p><a href="#">9B 201 Plant kingdom</a></p>	<p>9B 1 Classification - animal</p> <p><a href="#">9B 2 Classification - plant</a></p>
<p><b>9C Community organisation, food chains and food webs</b></p> <p>Identify organisms as producers, consumers or decomposers.</p> <p>Classify animals as carnivores, herbivores or omnivores.</p> <p>Draw and interpret food chains. from a food web..</p> <p>Discuss what can happen when a food web is disrupted.</p> <p>Discuss the role of energy in the food chain, its origin and that it is not recycled.</p> <p>Identify decomposers and scavengers in a community and explain their role in recycling nutrients.</p> <p>Use a diagram showing the numbers of organisms at each level of food pyramid to explain why communities support very few carnivores.</p> <p>Producer, consumer, decomposer, herbivore, carnivore, omnivore, scavenger, nutrients, recycling Food chain, food web, energy, pyramid of numbers</p>	<p>9.04 Forest birds</p> <p>9.05 A fresh-water community</p> <p>9.06 Cold water</p> <p>9.07 Unwelcome visitors</p> <p>9.08 Food pyramid</p>		<p>9C 101 Feeding groups</p> <p>9C 102 Classifying organisms</p> <p>9C 103 What are you?</p> <p>9C 201 Rock pool</p>	<p>9C 1 Feeding groups</p> <p>9C 2 Rocky shore food web</p>

<p><b>9D Adaptations and habitats</b></p> <p>Define the term adaptation as any feature that helps an organism to survive</p> <p>Give examples of both plant and animal adaptations and state whether they are physiological, behavioural or structural adaptations.</p> <p>Use information provided about an organism to describe its habitat, its niche and specific adaptations that help it to survive.</p> <p>Niche, habitat, adaptation, ( behavioural, physiological, structural) community,</p>	<p>9.09 Kiwi in crisis</p> <p><a href="#">9.10 Living together, working apart</a></p>	<p>9D 1 Organisms along a line</p> <p>9D 2 A community study</p>	<p><a href="#">9D 101 Adaptations</a></p> <p>9D 102 Living together</p> <p>9D 201 The sand dune community</p> <p>9D 202 Flax food web</p> <p>9D 203 Estuary food web</p> <p>9D Communities revision flip</p>	<p>9D 1 Adaptations and habitats</p> <p>9D 2 Fresh water food web</p>
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<b>10 Energy</b>				
<p><b>10A Energy and types of energy</b></p> <p>Identify different forms of energy in everyday situations (kinetic, sound, heat, electrical, radiant, gravitational potential, elastic potential, chemical potential magnetic potential and nuclear).</p> <p>State the unit of energy.</p> <p>Measuring the chemical potential energy in a fuel/peanut.</p>	<p>10.01 Sports day 10.02 Energy is everywhere! 10.03 Time through the ages* 10.04 Peanut power</p>	<p>10A 1 The energy content of fuels</p>	<p>10A 101 Types of energy 10A 102 Active or potential energy?</p>	<p>10A 1a Types of energy 1 10A 1b Types of energy 2</p>
<p><b>10B Energy transformations</b></p> <p>State that energy cannot be created nor destroyed, but only transformed from one kind to another.</p> <p>Identify energy transformations or draw energy change diagrams to show how energy is transformed in everyday situations.</p>	<p>10.05 Energy transformations 10.06 Energy changers</p>	<p>10B 1 Energy transformations</p>	<p>10B 101 Energy transformations 10B 102 Electrical transformations 10B 103 Energy converters 10B 104 Energy chains 10B 105 Energy changers</p>	<p>10B 1a Energy transformations 1 10B 1b Energy transformations 2</p>
<p><b>10C Electricity generation</b></p> <p>State that when a magnet moves through a coil of wire, electricity is produced.</p> <p>Apply an understanding of energy transformation to explain how electricity is generated in hydroelectric power stations and in thermal power stations.</p> <p>List different methods used in New Zealand to produce electricity, classifying each one as renewable or non-renewable and state the name or location of a power station for each one.</p> <p>Discuss social issues associated with electricity generation in New Zealand. .</p>	<p><a href="#">10.07 Generating electricity</a> 10.08 Renewable or non-renewable? 10.09 When the wind blows</p>	<p>10C 1 Generating electricity</p>	<p>10C 101 Renewable or non-renewable energy</p>	<p>10C 1 Renewable or non-renewable</p>

<p><b>10D Conservation of energy/applications</b></p> <p>Interpret results of an experiment into different forms of insulation to find the best insulator for a given situation.</p> <p>Apply an understanding of energy transformation to efficient use of energy in the home.</p>	<p>10.10 Insulation trial 10.11 Can you make tea using tealight candles? 10.12 Energy efficiency</p>		<p>10D 101 Transforming energy 10D 102 Energy efficiency and waste 10D 103 Saving money 10D Energy revision crossword 10D Energy revision flip cards</p>	<p>10D 1 Energy efficiency</p>
<b>Radiant energy and sound</b>				
<p><b>11 A Radiant energy</b></p> <p>List common light sources and state that objects that do not produce light are reflectors of light.</p> <p>Classify the Sun as a source of light and the Moon as a reflector of light.</p> <p>Distinguish between smooth surfaces that have a regular reflection and rough surfaces that have a diffuse reflection.</p> <p>List the properties of radiant energy: that it is a form of energy; that it travels in straight lines; that its speed in a vacuum is <math>3 \times 10^8 \text{ m s}^{-1}</math> or <math>300\,000 \text{ km s}^{-1}</math>; and that visible light is a small part of the electromagnetic spectrum.</p> <p>Name other parts of the electromagnetic spectrum.</p> <p>Explain, using a diagram that shadows form because light travels in straight lines.</p> <p>Draw a diagram to show how a pin-hole camera works and predict the effect of changing the screen distance or the hole size on the image formed by a pinhole camera.</p> <p>Identify substances as transparent, translucent or opaque to visible light.</p> <p>Transparent, translucent, opaque, regular, diffuse, source, reflector, gamma rays, X-rays, ultra-violet, infra-red, radio waves, microwaves.</p>	<p>11.01 Light words* 11.02 The electromagnetic spectrum* 11.03 Pinhole camera</p>	<p>11A 1 A pin-hole camera</p>	<p>11A 101 First light words 11A 102 First light words quiz 11A 103 Light facts close 11A 104 Light words 11A 201 Light facts 11A 202 The electromagnetic spectrum</p>	<p>11A 1a First light words 1 11A 1b First light words 2 11A 2 Light facts</p>

<p><b>11 B Mirrors</b></p> <p>State that the angle of incidence equals the angle of reflection.</p> <p>Describe the images formed in plane and curved mirrors</p> <p>Identify the ray and angle of incidence, the normal, and the ray and angle of reflection for plane mirrors.</p> <p>Use diagrams to show the ray paths in plane and curved mirrors.</p> <p>Identify plane, convex and concave mirrors, describe the images formed in each type of mirror and give examples of their uses in everyday life.</p> <p>Use an understanding of the different types of images in mirrors to explain why different mirrors are used in everyday situations.</p> <p>Plane, convex, concave, object, image, erect, inverted, laterally inverted, enlarged, diminished, same size, real, virtual, object distance and image distance, normal, ray, incidence, reflection.</p>	<p>11.04 Reflection words*</p> <p>11.05 Reflect on this</p> <p>11.06 Up periscope!</p> <p>11.07 Secret mirrors</p> <p><a href="#">11.08 Using mirrors</a></p>	<p>11B 1 The position of the image in a plane mirror</p> <p>11B 2 What is the angle of reflection?</p> <p>11B 3 Ray paths for a plane mirror</p> <p>11B 4 Looking into mirrors</p> <p><a href="#">11B 5 Ray paths for curved mirrors</a></p>	<p>11B 101 Plane mirrors</p> <p>11B 102 Plane mirrors</p> <p>11B 103 Curved mirrors</p> <p>11B 201 Mirrors and images</p> <p>11B 202 Images and mirrors</p> <p>11B 103 Curved mirrors</p> <p>11B 401 Which rays?</p>	<p>11B 1a Plane mirror reflection</p> <p>11B 1b Reflection in a plane mirror</p> <p>11B 2 Describing images</p> <p>11B 3 Curved mirrors</p> <p>11B 4 Ray diagrams – reflection</p>
<p><b>11C Refraction</b></p> <p>Describe refraction as the bending of light as it moves from one medium to another and explain this in terms of optical density.</p> <p>Draw a diagram to show the ray paths through a glass block and through a prism.</p> <p>Draw diagrams to show the ray paths as light enters and leaves thin converging (convex) and diverging (concave) lenses</p> <p>Describe images formed by converging and diverging lenses.</p> <p>Describe some everyday examples of the use of optical lenses or prisms.</p>	<p>11.09 Principles of refraction</p> <p>11.10 Mix and match</p> <p>11.11 Optical instruments</p>	<p><a href="#">11C 1 Light through a glass block</a></p> <p>11 C 2a Lenses</p> <p>11C 2b Images formed by convex lenses</p> <p>11C 3 Prisms</p>	<p>11C 101 Refraction key facts match</p> <p>11C 102 Lenses</p> <p>11C 201 Refraction diagrams</p> <p><a href="#">11C Light revision</a></p>	<p>11C 1 Refraction</p> <p>11C 2a Refraction through a glass block</p> <p><a href="#">11C 2b Ray diagrams - refraction</a></p>

<p><b>11D The eye</b></p> <p>Label a diagram showing the structure of the human eye and state the functions of the key parts.</p> <p>Describe how lenses can be used to correct long or short sight.</p> <p>Iris, retina, lens, cornea, optic nerve, blind spot, pupil, short-sighted, long-sighted.</p>	<p><b>11.12 Eye and camera</b></p>		<p>11D 101 The parts of the eye (drag and drop)</p> <p>11D 102 The parts of the eye (text)</p> <p>11D 201 Parts and functions of the eye</p> <p>11D 202 Eye functions</p> <p>11D 203 The eye true or false</p>	<p>11D 1 The eye</p> <p>11D 2 The eye – functions</p>
<p><b>11E Colour</b></p> <p>Use a prism to separate light into its colours</p> <p>Identify the colours of the spectrum</p> <p>Describe how coloured lights can be added to form other colours and white light.</p> <p>State that coloured objects reflect some of the colours of the white light, absorbing the rest.</p> <p>Predict, with justification, the effect of looking at coloured objects in coloured light.</p> <p>Draw a diagram to show what happens when white light is passed through a coloured filter.</p> <p>State that colours are made by subtraction when coloured paints are mixed and by addition when coloured lights are mixed.</p> <p>Reflection, transmission, absorption, spectrum, filter, cyan, magenta, addition, subtraction.</p>	<p><b>11.13 Colour</b></p> <p><b>11.14 Similarities and differences</b></p>	<p><b>11E 1 Colour</b></p>	<p>11E 101 Colours of the spectrum</p> <p>11E 102 Colours</p> <p>11E 103 Reflect or absorb</p>	<p>11E 1 Colour- reflect or absorb</p>

<p><b>11 F Waves and sound</b></p> <p>For a simple transverse wave, identify the wavelength and the amplitude, and label troughs and crests.</p> <p>Distinguish between transverse and longitudinal waves and give examples from everyday life of transverse and longitudinal waves.</p> <p>For groups of waves, identify those with higher or lower frequency.</p> <p>State that sound is a form of energy caused by the vibration of particles.</p> <p>Link the wavelength, frequency and amplitude of sounds to the pitch and volume heard.</p> <p>Label a diagram of an ear and state the function of the major parts.</p> <p>Explain why loud sounds can damage hearing.</p> <p>Identify animals that can hear different frequencies of sound to humans.</p> <p>Give examples of the practical applications of the reflection of sound.</p> <p>Transverse, longitudinal, amplitude, wavelength, frequency, sound, compression, rarefaction, trough, crest, pitch, volume, hertz, decibel, subsonic, ultrasonic, audible, inaudible, ear canal, auditory nerve, ear drum, ear bones, semicircular canals, Eustachian tube, pinna, cochlea</p>	<p>11.15 Wave words</p> <p>11.16 Making sound</p> <p>11.17 Echoes</p> <p><u>11.18 Hearing</u></p> <p>11.19 Highs and lows</p>	<p>11F 1 Wave types</p> <p>11F 2 Making sound</p>	<p>11F 101 Waves 1</p> <p>11F 102 Waves 2</p> <p>11F 103 Sound key facts</p> <p>11F 201 The parts of the ear (drag and drop)</p> <p>11F 202 The parts of the ear (text)</p> <p>11F 203 Sound and hearing</p> <p>11F 301 Sound key facts</p> <p>11F 302 Sound words</p> <p>11F Sound revision crossword</p>	<p>11F 1a Waves words</p> <p>11F 1b Reading waves</p> <p>11F 2 Ear</p> <p>11F 3 Sound words</p>
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<b>12 Our solar system</b>				
<p><b>12A An overview of the solar system</b></p> <p>Define the terms 'day' and 'year' as they apply to the planets.</p> <p>Identify the following elements of our solar system from a description: planet, moon, Sun, asteroid, meteoroid, comet, dwarf planet.</p> <p>Name the planets in order of distance from the Sun and identify a given planet from its characteristic features or a photograph.</p> <p>Identify specific landmarks from different planets or the major moons, and explain how two of them were formed.</p> <p>List the characteristic features that distinguish the terrestrial and gas giant planets.</p> <p>Research and present a written, oral or electronic report on one or more of the planets or moons of our solar system.</p> <p>Day, year, orbit, Sun, moon, planet, asteroid, dwarf planet, comet, crater, volcano, terrestrial planet, gas giant, ice giant, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, Ganymede, Callisto, Europa, Io, Titan, Moon, Ceres, Pluto.</p>	<p><b>12.01 Solar system words</b></p> <p><b>12.02 Crack the code</b></p> <p><b>12.03 Planet facts</b></p> <p><a href="#">12.04 Dwarf planets</a></p>	<p><a href="#">12A 1 A model solar system</a></p> <p><b>12A 2 Planetary highlights</b></p>	<p>12A 101 First solar system words</p> <p>12A 201 Order planets by distance</p> <p><a href="#">12A 202 Order planets by diameter</a></p> <p>12A 203 What kind of planet am I?</p> <p>12A 204 Planetary characteristics</p> <p>12A 205 Planets Memory</p> <p>12A 206 Order planets by temperature</p> <p>12A 301 Characteristics of gas giants and terrestrial planets</p> <p><a href="#">12A 401 Planets, dwarf planets, moons and asteroids</a></p>	<p>12A 1 First solar system words</p> <p>12A 2a Planets</p> <p>12A 2b Planet highs and lows</p> <p>12A 2c Recognising planets</p> <p>12A 3 Types of planet</p> <p><a href="#">12A 4 What kind of body is it?</a></p>

<p><b>12B Factors affecting the conditions on planets or moons</b></p> <p>Describe how a planet's distance from the Sun affects its surface temperature.</p> <p>Discuss the cause(s) of the surface temperature of each of the terrestrial planets, including both day-time and night-time temperatures.</p> <p>State that planets orbit the Sun in elliptical orbits; show the shape of an ellipse, and discuss the effects of elliptical orbits on the surface conditions of some planets.</p> <p>Describe the relationship between the mass of an object and its gravitational field.</p> <p>Discuss the effect of gravity on:</p> <ul style="list-style-type: none"> <li>– the shape of a body</li> <li>– core temperature</li> <li>– the internal structure of a planet or moon.</li> </ul> <p>Explain the relationship between volcanic activity and core temperature.</p> <p>Discuss how a planet's gravitational field and surface temperature determine whether the planet has an atmosphere.</p> <p>Describe the effect that having, or not having, an atmosphere has on the surface conditions of a planet or moon.</p> <p>Gravity, greenhouse effect, ellipse, focus (foci), eccentricity, perihelion, aphelion, atmosphere, pressure.</p>	<p>12.05 The greenhouse effect</p> <p>12.06 Gravity, Jupiter and its moons</p> <p>12.07 Planetary reasons</p> <p>12.08 Take a deep breath...</p> <p><a href="#">12.09 A matter of air pressure</a></p>	<p>12B 1 Understanding elliptical orbits</p>	<p>12B 101 Elliptical orbits</p> <p><a href="#">12B 102 Solar system wordsearch</a></p> <p>12B 201 Tell me why</p> <p>12B 202 Cause and effect</p> <p>12B 301 Recognising planets</p> <p>12B 302 Where am I?</p>	<p><a href="#">12B 1 Orbits</a></p> <p>12B 2 Causes</p> <p>12B 3a Recognising planets</p> <p>12B 3b Where am I?</p>
<p><b>12C Missions in space</b></p> <p>Recall the names of at least two space probes and the planets they went to.</p> <p>Discuss the problems to be solved before people can live on the Moon or Mars.</p> <p>Voyager, Apollo, Cassini, Phoenix,</p>	<p>12.09 Where am I?</p> <p>12.10 Research questions</p> <p>12.11 Solar system crossword</p>	<p>11C 1 Planetary explorations</p>	<p>12C 102 Interplanetary missions</p> <p>12C Solar system revision flip cards</p>	<p>12C 1 Missions</p>

