



Roundhill Primary School: RPS Specialist Formal framework Science

Science: Scientific Enquiry and practical / Transferable skills

Learning profile B1

SC1a – Observations and Theory

- Observe a practical demonstration

SC1b – Predictions and Fair testing

- Listen to the predictions of others, I might agree / disagree

Sc1C – Method, variables, repeats

- Follow a simple method step by step

SC1d – Equipment and measurement

- Use simple equipment (e.g. magnifying glasses) to make a simple observation

SC1e – Data collection

- Record my results in a table the teacher has given me

SC1f – Conclusion

- Say what happened in a practical

Learning profile B2

SC1a – Observations and Theory

- Think about why something happens and think about how I could prove it. I'm not always right

SC1b – Predictions and Fair testing

- Make a prediction based on limited knowledge / understanding

Sc1C – Method, variables, repeats

- Follow a simple method following demonstration

SC1d – Equipment and measurement

- Choose the correct equipment to make observations and measurements for my practical.

SC1e – Data collection

- Record my results in a table or a bar chart with some help

SC1f – Conclusion

- Say if what happened in a practical is what I thought would happen

Learning profile B3

SC1a – Observations and Theory

- Know that what I learn in Science is true, because there is evidence (proof)

SC1b – Predictions and Fair testing

- In practical work, carry out a fair test with help OR collect data with help



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Sc1C – Method, variables, repeats

- Follow a multi-step method following demonstration

SC1d – Equipment and measurement

- Select apparatus for a range of tasks and plan to use it correctly

SC1e – Data collection

- Record my observations, comparisons and measurements using tables and bar charts

SC1f – Conclusion

- Say what happened using my results to help me.

Learning profile B4

SC1a – Observations and Theory

- Describe how Scientists use their experiments, their data and their creative thinking to provide a Scientific explanation

SC1b – Predictions and Fair testing

- Make a prediction and link it to what I have learnt in Science lessons

Sc1C – Method, variables, repeats

- Identify the things I need to keep the same, and the thing I need to change in a fair test
- Beginning to write my own methods

SC1d – Equipment and measurement

- Make observations, comparisons or measurements accurately, using correct units e.g. cm

SC1e – Data collection

- Present data in a line graph that has pre-prepared axis

SC1f – Conclusion

- Say what happened, using my results to help me, and describe a relationship in the work I have done

Learning profile B5

SC1a – Observations and Theory

- In my own practical work, explain how the results I gather will support accepted Scientific theory

SC1b – Predictions and Fair testing

- In my practical work, carry out a fair test and collect data independently

Sc1C – Method, variables, repeats

- Do two or more tests for the same experiment

SC1d – Equipment and measurement

- Measure a variety of quantities with precision, using instruments that have decimal values e.g. weighing scales, rulers, stop clocks

SC1e – Data collection

- Present data in a line graph that I make myself. There may be some errors



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- Identify anomalous results

SC1f – Conclusion

- My conclusion is based on what my evidence shows. Use scientific knowledge to support my conclusion.

Learning profile B6

SC1a – Observations and Theory

- Describe the importance of Scientific research in further refining Scientific theory
- Show an understanding of how Scientists need to be aware of the ethics behind what they are doing

SC1b – Predictions and Fair testing

In my practical work:

- make a prediction linked to what I have learnt
- decide on how to carry out a fair test independently
- collect data independently
- describe what I have found out

Sc1C – Method, variables, repeats

- Carry out at least 3 repeats for each test and create a table of results with averages

SC1d – Equipment and measurement

- Measure a variety of quantities consistently, recording to the same place value where appropriate and calculating mean values when required

SC1e – Data collection

- Present accurate data in an appropriate format, scaled correctly, highlighting any anomalous results

SC1f – Conclusion

- My conclusion matches what my evidence shows. Use scientific knowledge to support my conclusion and can add diagrams to further support my evidence

Science: Physical Science

Learning profile B1

SC4a – Forces

- Identify that something is moving or not moving

Sc4b – Magnetism

- Identify magnets and show simply what they can do

Sc4c – Speed, distance, time

- Identify something as speeding up, slowing down, or standing still

Sc4d – Energy

- Identify things that need energy to work



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Sc4e – Waves

- Give examples of things that make light and sound

Learning profile B2

Sc4a – Forces

- Distinguish between objects moving as a result of pushing, or pulling

Sc4b – Magnetism

- State the ability of a magnet to attract and repel

Sc4c – Speed, distance, time

- Identify something as moving at constant speed

Sc4d – Energy

- Name three examples of energy (at least one renewable)

Sc4e – Waves

- State what happens to sound when it travels over a distance, and what happens to light when it travels through solids, liquids and gases

Learning profile B3

Sc4a – Forces

- Describe what the terms balanced and unbalanced forces means, using diagrams to help my description

Sc4b – Magnetism

- Draw magnetic field lines, identifying the poles

Sc4c – Speed, distance, time

- Describe the differences between speeding up, slowing down and constant speed in terms of forces

Sc4d – Energy

- Name all the different types of energy store and give examples of where they are used

Sc4e – Waves

- Describe what reflection, refraction and dispersion mean

Learning profile B4

Sc4a – Forces

- Measure forces using appropriate equipment and units

Sc4b – Magnetism

- Describe what a permanent magnet is, identifying the main magnetic materials



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Sc4c – Speed, distance, time

- Describe the relationship between speed, distance and time using correct units

Sc4d – Energy

- Describe how energy can be wasted e.g. a kettle making noise, a torch getting warm

Sc4e – Waves

- Simply compare the properties of light and sound waves (limited to presence/lack of particles, generation of heat energy)

Learning profile B5

SC4a – Forces

- Explain what the terms equilibrium and deformation mean using Hooke's law as an example

SC4b – Magnetism

- Make a simple electromagnet and describe how it works

SC4c – Speed, distance, time

- Draw and interpret distance / time graphs

SC4d – Energy

- Draw diagrams to show energy transfer and energy wastage

SC4e – Waves

- Describe the properties of sound waves, and explain what pitch, amplitude and frequency mean
- Describe the properties of light waves and explain what wavelength means

Learning profile B6

Sc4a – Forces

- Explain what pressure is, and how it can affect gases and liquids

Sc4b – Magnetism

- Apply my knowledge of electromagnets to large scale energy production

Sc4c – Speed, distance, time

- Predict how the motion of an object will change dependent on the forces acting upon it

Sc4d – Energy

- Show how an energy store can be changed into another e.g. by a car moving, or by a parachute falling

Sc4e – Waves

- Use my understanding of light waves to explain the concept of the electromagnetic spectrum, giving examples of wavelength use in industry



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Science: Chemical Science

Learning profile B1

Sc3a – Chemical structure

- Identify materials in use e.g. wood, metal

Sc3b – Solids, liquids, gases

- Identify wood as a solid, water as a liquid, and air as a gas

Sc3c – Separation techniques

- Separate two dried materials from each other e.g. dried peas and sand

Sc3d – Reactions

- Identify that a reaction has taken place (sensory cues)

Sc3e – Climate

- Take part in recycling activities

Learning profile B2

SC3a – Chemical Structure

- Correctly suggest uses for materials

SC3b – Solids, Liquids, Gases

- Group different materials as solid, liquid or gas

SC3c – Separation techniques

- Demonstrate separation in a solution through evaporation

SC3d – Reactions

- Suggest if a reaction is reversible or irreversible e.g. ice melting, wood burning

SC3e – Climate

- Talk about ways that I could save (or make) energy in my home

Learning profile B3

Sc3a – Chemical structure

- Group materials together simply based on their visual properties e.g. shiny, bendy.

Sc3b – Solids, liquids, gases

- Describe the properties of solids, liquids and gases (shape and volume) in relation to the particles within them

Sc3c – Separation techniques

- Demonstrate separation of a solution through mass (chromatography)

Sc3d – Reactions

- Identify and describe reversible and irreversible changes in everyday life e.g. baking a cake, diluting squash, cooking meat, making ice

Sc3e – Climate

- Name 3 fossil fuels and say where they came from



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Learning profile B4

Sc3a – Chemical structure

- Describe the chemical properties of materials e.g. as a solid, malleable, heat conductivity

Sc3b – Solids, liquids, gases

- Begin to name some of the elements within material e.g. water is hydrogen and oxygen

Sc3c – Separation techniques

- Describe why separation techniques work and given examples, can suggest and trial the most appropriate separation technique to use

Sc3d – Reactions

- Describe how the amount of matter that goes into a reaction, is the same as what comes out (reactants and products)

Sc3e – Climate

- Name greenhouse gases and describe how they contribute to the greenhouse effect

Learning profile B5

Sc3a – Chemical structure

- Compare the chemical properties of a number of different materials based on their chemical structure (e.g. diamond/graphite)

Sc3b – Solids, liquids, gases

- Explain what the periodic table is, and how it can be used to predict the behaviour of elements within it

Sc3c – Separation techniques

- Demonstrate and explain how external factors e.g. Heat impact upon elements and mixtures

Sc3d – Reactions

- Describe what combustion is and how to tell if a combustion reaction has happened

Sc3e – Climate

- Explain the importance of carbon sinks

Learning profile B6

Sc3a – Chemical structure

- Can explain how the chemical structure of a material allows the material to perform the way it does

Sc3b – Solids, liquids, gases

- Draw and label 5 examples of elements using the Dalton model, identifying neutrons, protons and electrons

Sc3c – Separation techniques

- Explain the differences between elements, compounds and mixtures giving a variety of examples

Sc3d – Reactions

- Explain the process of thermal decomposition and demonstrate this through specific practical work

Sc3e – Climate

- Using data, explain the link between rising sea levels, deforestation and rising global temperatures to greenhouse gas production.



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Science: Biology

Learning profile B1

SC2a – Life processes, staying healthy

- Show an acknowledgement of hunger/pain/needing the toilet/feeling hot or cold
- Water a plant, give it sunlight
- Care for animals by feeding them, petting them, cleaning them

SC2b – Plants for life

- Group plants simply e.g. flowers and trees

SC2c – Life cycles

- Acknowledge a difference in age e.g. older than, younger than

SC2d – Human anatomy

- Identify major body parts e.g. arm, leg.
- Locate these major body parts on my body

SC2e - Plant Physiology

- Identify major plant parts e.g. flower, leaf
- Locate these plant parts on a diagram or real plant

SC2f – Classification

- Group living things simply, e.g. animals that have/don't have fur

SC2g – Environment and Feeding Relationships

- Recognise that different living things are found in different places

SC2h – Health and Disease

- State when I am feeling well, poorly, tired

Learning profile B2

SC2a – Life processes, staying healthy

- State 2 or more things that an animal and plant need in order to live

SC2b – Plants for life

- Identify the main visible organs of plants (root, shoot, flower)
- Identify a deciduous tree from an evergreen, and make comparisons

SC2c – Life cycles

- Recognise that living things grow, and can reproduce

SC2d – Human anatomy

- Use scientific names for some major organs inside the body e.g. heart, stomach.
- Identify the positions of these organs in the human body



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SC2e - Plant Physiology

- Use scientific names for some major organs of the plant e.g. anther, stamen, root
- Identify the positions of these plant parts on a diagram

SC2f – Classification

- State why some living things change, e.g. leaves in autumn
- Describe why I have grouped living things in a certain way

SC2g – Environment and Feeding Relationships

- Identify ways in which an animal is suited to its environment e.g. fur thickness

SC2h – Health and Disease

- Describe why it is important to wash my hands before eating and after going to the toilet, talking specifically about bacteria.

Learning profile B3

SC2a – Life processes, staying healthy

- Identify whether something is alive or dead based on what it is doing / not doing

SC2b – Plants for life

- Identify the main plant reproductive organs (stamen, stigma, anther) and demonstrate the plant reproductive cycle

SC2c – Life cycles

- Identify stages within a human life cycle (minimum 2)

SC2d – Human anatomy

- Describe the role of five main internal organs (heart, lungs, kidneys, stomach, brain)

SC2e - Plant Physiology

- Describe the role of five main plant reproductive organs (anther, stamen, stigma, style, ovary, carpel)

SC2f – Classification

- Use keys based on what you see to identify and group living things

SC2g – Environment and Feeding Relationships

- Make a food chain to show the relationship between predators and prey

SC2h – Health and Disease

- Make a link between a person being ill, and the spread of disease through coughing, sneezing, or poor hygiene

Learning profile B4

SC2a – Life processes, staying healthy

- Name and describe the seven life processes using given examples

SC2b – Plants for life

- Know the equation for photosynthesis, and can identify where each of the reactants, products and catalysts are located
- Identify the main parts of a leaf, and explain their role in photosynthesis



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SC2c – Life cycles

- Correctly order the stages of the human life cycle (birth, childhood, adolescence, adulthood, death) and describe key elements of some of these stages
- Correctly order the stages of the plant life cycle (seed, germination, flowering, fruiting, death) and describe key elements of some of these stages

SC2d – Human anatomy

- Group organs based on how they work together e.g. digestive system. Special reference to nervous system and senses / sense organs

SC2e - Plant Physiology

- Group plant organs based on how they work together e.g. roots and shoots for transport, leaves for gas exchange

SC2f – Classification

- Recognise that there is a lot of variation in living things, and this is why we classify organisms
- Describe what inheritance is

SC2g – Environment and Feeding Relationships

- Explain that different organisms are found in different habitats because of differences in environmental factors e.g. temperature

SC2h – Health and Disease

- Draw, label and compare 3 main groups of organisms (bacteria, fungi, virus)

Learning profile B5

SC2a – Life processes, staying healthy

- Explain the importance of a balanced diet, and provide examples of balanced diets from different cultures

SC2b – Plants for life

- Describe the process of transpiration and why this is important to the plant's survival

SC2c – Life cycles

- Explain similarities and differences between human and plant life cycles

SC2d – Human anatomy

- Describe the main functions of organ systems in the human body
- Explain how organs are made up of tissues, with tissue being made up of different cells (named examples; heart and skin)

SC2e - Plant Physiology

- Name and describe the roles of specialised plant cells (root hair, guard cell, xylem, phloem)

SC2f – Classification

- Describe some of the causes of variation between living things based on environment

SC2g – Environment and Feeding Relationships

- Construct a food web to explain the process of interdependence

SC2h – Health and Disease

- Explain how antibiotics work against bacteria and some fungi, but not against viruses



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Learning profile B6

SC2a – Life processes, staying healthy

- Plan, carry out and reflect on an exercise regime, explaining the importance of keeping fit on health and wellbeing

SC2b – Plants for life

- Explain what limiting factors are in relation to photosynthesis and transpiration

SC2c – Life cycles

- Explain what dormancy means and its importance in the plant life cycle
- Explain why dormancy occurs in bacteria

SC2d – Human anatomy

- Draw and describe simple animal cell structure, explaining how a variety of specialised cells are needed to create an organism

SC2e - Plant Physiology

- Explain why plants show a variety in leaf shape and structure (e.g. cactus needles, variegated leaves etc)

SC2f – Classification

- Explain how variation is caused by genetics and how variation can lead to evolution

SC2g – Environment and Feeding Relationships

- Use pyramids of biomass and number to explain the relationships between predators and prey

SC2h – Health and Disease

- Explain the importance of vaccination programmes in the fight against named diseases e.g. MMR, Smallpox