

SCIENCE PREP — CHEMICAL SCIENCE

Science Detectives – Exploring Materials and Their Properties

Unit Overview	Students become Science Detectives as they investigate everyday objects and the materials from which they are made. Through stories, hands-on investigations, observation, sorting, comparison and discussion, students develop an understanding that objects can be made from different materials and that materials have observable properties. The sequence progresses from observing and identifying materials to comparing, sorting, predicting, investigating and communicating. The unit culminates in a Material Museum.
Achievement Standard	Students build evidence of their ability to recognise that everyday objects are composed of materials with observable properties. They participate safely in investigations, make and represent observations, compare findings and communicate scientific ideas.
Duration	7 lessons
Unit Rationale	The unit uses familiar objects and a story-based Science Detectives context to develop early scientific thinking. Students look closely, ask questions, make predictions, investigate, compare and communicate discoveries.
Key Concepts	Objects are made from materials; materials have observable properties; materials can be compared and sorted; properties influence usefulness; materials react differently to water; scientists observe, question, predict, investigate, compare and communicate.

Year	Prep / Foundation
Australian Curriculum Science Content Descriptors	AC9SFU03 – Recognise that objects can be composed of different materials and describe the observable properties of those materials. AC9SFH01 – Explore how scientists use observation and questioning to learn about the natural world.
Science Inquiry Skills	AC9SFI01 – Pose questions and make predictions based on experiences. AC9SFI02 – Engage safely in investigations and make observations using the senses. AC9SFI03 – Represent observations using provided templates and identify patterns with guidance. AC9SFI04 – Compare, sort and organise observations and information within the lesson investigations. AC9SFI05 – Share questions, predictions, observations and ideas with others.

General Capabilities	Literacy; Numeracy; Critical and Creative Thinking; Personal and Social Capability.
Monitoring	Teacher observation, questioning, oral responses, sorting/classification decisions, predictions, investigation behaviours, visual recording tasks and student explanations.
Formative Assessment	Lessons 1–6 provide evidence through observation and prediction tasks, material identification, texture rubbings, sorting, recycling classification and the Water Detectives comparison investigation.
Summative Assessment (Final Task)	Lesson 7 – Material Museum. Students choose an everyday object, identify its material, describe observable properties, explain why the material is useful and communicate their understanding to an audience.
Success Criteria	Observe an object carefully; identify its material; describe observable properties; connect a property to usefulness; communicate observations and ideas; answer simple questions.
Considerations for teaching and learning in this unit	Keep learning visual, oral and hands-on. Use real objects wherever practical. Explicitly model vocabulary and sentence stems. Allow students to demonstrate understanding through pointing, selecting, sorting, matching, drawing and oral explanation rather than relying on independent writing.
Prior Knowledge Students Require	Identify familiar objects; use basic descriptive language; recognise similarities and differences; follow basic safety instructions; participate in discussion and take turns.
Investigating safely	Use senses safely; do not taste materials; smell only when directed; supervise sharp/breakable items; use scissors appropriately; use small quantities of water; wipe spills immediately; wash hands where required; follow relevant school/CARA procedures.
Key Vocabulary	object • material • property • observe • senses • investigate • question • predict • prediction • evidence • compare • sort • group • texture • wood • metal • plastic • glass • rubber • fabric • paper • cardboard • hard • soft • rough • smooth • bumpy • shiny • flexible • strong • light • heavy • wet • dry • soggy • absorb • waterproof • recycle • environment • useful • curator • display • communicate
Resources to support knowing and engaging your learners	Real objects; visual vocabulary cards; Science Detective stories and visuals; magnifying glasses; sensory objects; sorting hoops/trays; material samples; photographs; partner talk; investigation stations; picture-based recording sheets; Material Museum display cards.

7-Lesson Teaching and Learning Sequence

Lesson	Focus / Big Idea	Pedagogy	Curriculum Links	Learning Intentions	Success Criteria	Differentiation	Hands-On & Adventure Tasks	Science Journal Evidence (Portfolio)	Assessment Links / Evidence Collected	Materials & Resources
1 – The Mystery Science Box	Scientists use observations as evidence. Materials have observable properties.	Story-based inquiry; explicit modelling; sensory investigation	AC9SFU03; AC9SFH01; AC9SFI01–05	Use senses safely to observe objects, describe properties and make predictions using evidence.	Safely observe; describe; predict; share discoveries.	Picture vocabulary; oral responses; partner talk; teacher scribing; extend with evidence-based explanations.	Investigate mystery objects before identifying them.	Observation/prediction recording sheet.	Baseline evidence of property vocabulary, observation and prediction.	Mystery box; objects; magnifying glasses; vocabulary visuals; recording sheet.
2 – Material Detectives	Objects are made from different materials.	Guided inquiry; exploration; object hunt	AC9SFU03; AC9SFI02; AC9SFI03; AC9SFI05	Investigate everyday objects to identify materials and describe observable properties.	Identify material; describe; compare; share.	Picture matching; peer support; extend to multi-material objects.	Material Hunt: wood, plastic, metal, glass, rubber and fabric.	Material Detective drawings/recording sheet.	Material identification and appropriate property vocabulary.	Everyday objects; material samples; magnifying glasses; hunt sheet.
3 – Texture Treasure Hunt	Texture is an observable property that can be investigated and compared.	Sensory exploration; outdoor investigation	AC9SFU03; AC9SFI02; AC9SFI03; AC9SFI05	Investigate and compare materials by exploring textures.	Observe textures; describe; compare; record with rubbing.	Visual texture words; model rubbing; partner support; comparative language extension.	Find safe textured surfaces and make rubbings.	Texture rubbing collection.	Observation, comparison and texture vocabulary.	Paper; crayons; clipboards; safe textured surfaces; vocabulary cards.
4 – Sorting Surprise	Objects can be classified in different ways using materials and properties.	Story inquiry; classification; collaborative problem-solving	AC9SFU03; AC9SFH01; AC9SFI02; AC9SFI03; AC9SFI05	Observe, compare and sort objects using properties and explain the sorting rule.	Observe; describe; sort; re-sort; explain; compare.	Physical/picture sorting; prompts; extension using multiple valid rules.	Sort familiar objects using different rules.	Photo/drawing or teacher record of groups.	Can the student classify logically and explain why objects belong together?	Sorting objects; hoops/trays; picture cards; story visuals.
5 – Recycling Scientists	Materials can be identified and sorted; recycling allows materials to be used again.	Real-world problem solving; classification	AC9SFU03; AC9SFI04; AC9SFI05	Identify materials, sort objects and explain how recycling helps the environment.	Observe; identify; sort; explain rule; describe recycling purpose.	Colour/picture-coded bins; model items; extension with mixed-material packaging.	Sort clean waste into plastic, paper/cardboard, glass and metal.	Visual recycling sorting record.	Material identification and classification justification.	Clean recyclables; labelled bins; recycling visuals.
6 – Water Detectives	Different materials respond differently to water.	Predict–observe–compare investigation	AC9SFU03; AC9SFI01; AC9SFI02; AC9SFI04; AC9SFI05	Predict, observe and compare what happens when materials contact water.	Describe; predict; observe; compare; identify absorbent/non-absorbent; use evidence.	Picture choices; teacher demonstration; partner investigation; oral evidence explanations.	Test selected materials using small amounts of water.	Visual comparison worksheet – no writing required.	Prediction vs observation; absorbency; comparison; oral evidence.	Water trays/cups; droppers; material samples; towels; visual worksheet.
7 – Material Museum	Scientists communicate discoveries. Properties help explain why materials are useful.	Culminating inquiry; authentic audience; oral communication	AC9SFU03; AC9SFI01; AC9SFI02; AC9SFI05	Observe objects, identify materials, describe properties and explain usefulness.	Observe; identify; describe; explain usefulness; share; answer questions.	Visual Museum Card; oral presentation; teacher scribing; partner rehearsal; extension connecting multiple properties to function.	Choose an object, investigate it, create a museum display and visit classmates’ exhibits.	Museum Display Card + oral explanation.	SUMMATIVE: material identification, properties, property/use connection and scientific communication.	Everyday objects; magnifying glasses; Museum Display Cards; pencils/crayons; display tables/signs.

Assessment progression: Observe & Describe → Identify → Compare → Sort → Apply → Predict & Investigate → Explain & Communicate