Lesson 5  Mixtures and substances — Exploring everyday applications of mixtures

### Lesson concepts

- Mixtures can be separated using a range of techniques
- People use science understanding across occupations
- Experiments are collaboratively conducted ensuring safety guidelines are followed
- Ideas and findings are communicated using scientific language and representations

### Embedding Aboriginal and Torres Strait Islander perspectives in this lesson

Students access information about separation techniques used by the Kanomi including hand-picking, sieving and winnowing.

Supporting learning resource — [Indigenous Australian separation techniques](http://www.qm.qld.gov.au/Learning+Resources/QM+Loans/Whats+New)

Website — [QM Loans — Aboriginal science, technology and trade](http://www.qm.qld.gov.au/Learning+Resources/QM+Loans/Whats+New)

The Embedding of Aboriginal and Torres Strait Islander perspectives into the curriculum requires more than addressing curriculum and pedagogy. For further information refer to [Delivering Aboriginal & Torres Strait Islander perspectives in the classroom](http://www.qm.qld.gov.au/Learning+Resources/QM+Loans/Whats+New).

### Example learning sequence

**Discuss separation techniques (Cultural Walk)**

- Make suggestions about types of separation techniques.
- Consider how Indigenous Peoples have used separation techniques over time and have students participate in separating water in the swamp at Maizie Bay.
- Define simple separation techniques such as hand-picking, sieving and winnowing.

**Describe other everyday applications of separation techniques**

- Discuss ways that separation techniques are used in everyday life such as cooking.
- Make suggestions about professions that use separation techniques.

**Explore simple separation techniques**

- Participate in an activity on the separation technique of paper chromatography. ½ group
- Communicate ideas and findings about paper chromatography.
- Describe professional applications for paper chromatography as a separation technique.
- Consider the importance of fair testing in relation to paper chromatography.
- Observe a demonstration of evaporation as a separation technique. ½ group
Ideas for monitoring
Monitor students’ ability to:
identify substances and mixtures
and state everyday applications
of separation techniques across
professions.

Learning alerts
Be aware of:
students stating that mixtures
containing liquids cannot be
separated.

Suggested next steps for
learning
Demonstrate to students that
liquid mixtures are able to be
separated using a range of
techniques such as evaporation
and chromatography.

Ideas for differentiation
Support
Students practise simple
separation techniques such as
sieving to assist in their
understanding of mixtures.

Extension
Students develop a fair test for a
simple separation technique.

Example resources
Materials and equipment list

Image — Indigenous wooden container from New South Wales
(Australian Museum, number E68140, http://www.australianmuseum.net.au)
Supporting learning resource — Indigenous Australian separation

Learning techniques
Supporting learning resource — Simple separation techniques:
Definitions
Sheet — Chromatography procedure — Teacher instructions
Sheet — Chromatography procedure — Student instructions
Sheet — Ransom set up — Teacher instructions
Supporting learning resource — Evaporation separation technique
demonstration
Supporting learning resource — Everyday applications of separation
techniques
Sheet — Monitoring task — Mixtures and substances
Sheet — Monitoring task — Mixtures and substances: Modelled
student response

Helpful Information
Website — QM Loans — Aboriginal science, technology and trade
(Queensland Museum)

Video — Hidden colours in black ink — Part A
Video — Hidden colours in black ink — Part B

Safety
Teachers need to:
• identify safety issues relevant to practical activities and conduct
risk assessments
• refer to Workplace health and safety (WHS) policy pertaining to
schools.
• use Chemwatch Gold to consult the relevant MSDS (Materials
Safety Data Sheets) for chemical safety information pertaining to
the use of borax
Australian Curriculum references for this lesson

Year 7 Science — Content descriptions

Science Understanding

Chemical sciences
Mixtures, including solutions, contain a combination of pure substances that can be separated using a range of techniques

Science as a Human Endeavour
Use and influence of science
People use understanding and skills from across disciplines of science in their occupations

Science Inquiry Skills
Planning and conducting
Collaboratively and individually plan and conduct a range of investigation types, including fieldwork and experiments, ensuring safety and ethical guidelines are followed

Communicating
Communicate ideas, findings and solutions to problems using scientific language and representations using digital technologies as appropriate

View a mapping of the Science Content descriptions for this unit
View a mapping of the Science Content descriptions for this year level

General capabilities

Literacy
• Comprehending texts through listening, viewing and reading
• Composing texts through speaking, writing and creating
• Text knowledge
• Word knowledge
• Visual knowledge

Numeracy
• Interpreting and drawing conclusions from statistical information

ICT capability
Queensland Student ICT Expectations:
• Operating with ICT

Australian Curriculum ICT learning continuum:
• Managing and operating ICT

Critical and creative thinking
• Inquiring — identifying, exploring and clarifying information
• Generating innovative ideas and possibilities
• Reflecting on thinking, actions and processes

Personal and social competence
• Social management

Intercultural understanding
• Responsibility

View a mapping of the General capabilities learning continua for this unit

Cross-curriculum priorities
Aboriginal and Torres Strait Islander histories and cultures
• Access information about Aboriginal Peoples’ techniques for separating mixtures