## Lesson 6: Separation of mixtures — Exploring separation techniques

### Lesson concepts

- Mixtures, including solutions can be separated using a range of techniques
- People use science understanding across occupations
- Experiments are collaboratively conducted, ensuring safety guidelines are followed
- Data from investigations is summarised and conclusions are drawn
- The method used is evaluated and reflected on
- Findings and solutions are communicated using scientific language and representations

### Example learning sequence

#### Review mixtures and substances

- Revise definitions of mixtures, substances and solutions.
- Discuss simple separation techniques and their uses.
- View an example of a distillation separation technique.

#### Explore a range of separation techniques (1/2 Group)

- Conduct problem-solving activities in order to separate substances from mixtures.
- Communicate their findings on separation techniques.
- Draws a conclusion using findings.
- Discuss the method used to solve the problem of separating a mixture.

#### Review evaporation as a separation technique (1/2 Group)

- Revisit the separation demonstration on evaporation.
- Discuss the effectiveness of evaporation as a separation technique.
- Setup Make some salt down on the beach

#### Revise everyday applications of separation techniques

- Review separation techniques that are used in everyday situations.
- Discuss professions that use the range of separation techniques explored.

### Example resources

- **Materials and equipment list**
  - Supporting learning resource — [Problem-solving activities for separating mixtures](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Supporting learning resource — [Everyday applications of separation techniques](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Tray and crystals from evaporation demonstration

### Helpful information

- Video — [Make some salt — Part A](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
- Video — [Make some salt — Part B](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
- Website — [Compounds and mixtures](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml) (BBC KS3 Bitesize)

### Lesson objectives

**Students will:**

- identify ways to separate substances from mixtures.

### Evidence of learning

**Can the student:**

- separate substances from a mixture?

### Safety

**Teachers need to:**
Ideas for monitoring
Monitor students’ ability to:
select appropriate equipment and method for the task requirements.

Learning alerts
Be aware of:
- students who think that a mixture always has a liquid component
- students who think that mixtures containing liquid cannot be separated.

Suggested next steps for learning
Inform students that mixtures can be made of any combination of solids, liquids and gases.
Demonstrate to students that liquid mixtures are able to be separated using a range of techniques.

Ideas for differentiation
Support
- Allow students to work in mixed ability groups to gain advantage from a range of student knowledge and or peer tutoring.

Extension
- Provide students with opportunities to separate more complex mixtures.
- identify safety issues relevant to practical activities and conduct risk assessments on separating mixtures
- refer to Workplace health and safety (WHS) policy pertaining to schools.

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

Processing and analysing data and information
Summarise data, from students’ own investigations and secondary sources, and use scientific understanding to identify relationships and draw conclusions

Evaluating
Reflect on the method used to investigate a question or solve a problem, including evaluating the quality of the data collected, and identify improvements to the method

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

Australian Curriculum: Science for Prep(F)-10 Version 3.0
http://www.australiancurriculum.edu.au/Science/F-10
[accessed on 28 July 2012]

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 capability
• Social management

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