**Lesson concepts**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Icon</th>
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<tbody>
<tr>
<td>Mixtures, including solutions can be separated using a range of techniques</td>
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<tr>
<td>Experiments are collaboratively planned and conducted</td>
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<tr>
<td>Data from investigations is summarised and conclusions are drawn</td>
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<tr>
<td>The method is reflected on and results evaluated</td>
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<tr>
<td>Findings and solutions are communicated using scientific language and representations</td>
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**Example learning sequence**

### Review separation techniques

- Revise the types of separation techniques previously explored.
- Describe new separation techniques including filtration, decantation and distillation.
- Define the phrase ‘reclaimed substance’ and examine how to measure the amount of a substance reclaimed.

### Explore distillation as a separation technique

- Observe a distillation separation example and consider the results.
- Reflect on the effectiveness of distillation as a separation technique.
- Describe everyday applications of distillation.

### Consolidate a range of separation techniques

- View correct processes to be followed when applying different separation techniques.
- Collaboratively plan appropriate techniques to be applied to separate a given mixture.
- Practise correct separation techniques (solar still on beach) of a sea water mixture.
- Draw a conclusion using findings.

### Reflect on their learning

- Define mixtures and substances.
- Identify and describe separation techniques.
- Reflect on misunderstandings and common alternative conceptions that may arise during discussion.

**Example resources**

- **Materials and equipment list**
  - Supporting learning resource — [Everyday applications of separation techniques](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Sheet — [Separation procedures — Student instructions](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Sheet — [Separation technique posters](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Learning object — [Space Lab: Grumpy in the Desert](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml) © Curriculum Corporation and education.au limited

- **Helpful information**
  - Video — [Collect water](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Video — [Solar water cleaner — Part A](http://www.bbc.co.uk/schools/ks3bitesize/science/chemical_material_behaviour/compounds_mixtures/activity.shtml)
  - Video — [Solar water cleaner — 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)
separating substances.

Learning alerts
Be aware of:
- students who think that solutes disappear when they dissolve
- students who think that a mixture always has a liquid component
- students selecting inappropriate separation techniques for the task.

Suggested next steps for learning
Clarify with students that solutes are always present in a solution, but are too small to be seen.
Remind students that mixtures can be made of any combination of solids, liquids and gases.
Review the different types of separation techniques and explain best use.

Ideas for differentiation
Support
Provide students with further opportunities to practise correct separation techniques.

Extension
Students investigate separating liquids of differing densities such as oil and water and explore everyday applications for these techniques.

Safety
Teachers need to:
- 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 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 improvement 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 27 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
- Using measurement

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