



## Components

	NAME	DESCRIPTION	AUDIENCE
	<i>Recycling water</i> teacher guide	This guide explains how to use the resources to direct students in learning about water recycling and ground water replenishment in Western Australia.	teachers
	<i>Student reporting sheet</i> worksheet	This enables students to collate thoughts and information about water recycling and replenishment.	students
	<i>Groundwater replenishment — Part 4: New water sources</i> video	This details the how and why of the Water Corporation's groundwater replenishment scheme.	students
	<i>Water treatment</i> procedure sheet	This guides students through steps to treat wastewater, simulating processes used by the Water Corporation.	students

## Purpose

To help students consider the viability of ground water replenishment and water recycling.

## Outcomes

Students:

- understand that scientific knowledge should inform, and be used to evaluate, or to predict whether a technology may be successfully introduced into a community;
- understand new technologies can affect a community in both positive and negative ways as well as create new opportunities for people;
- appreciate the decision-making process is multi-layered and that ideas should be investigated, not dismissed at first look;
- consider how to use research to inform the decision-making process;
- perform scientific experiments to test ideas; and
- present an argument, with supporting evidence, to justify a course of action.

## Technical requirements

The teachers guide, worksheet and procedure sheet require Adobe Reader (version 5 or later), which is a free download from [www.adobe.com](http://www.adobe.com). The procedure sheet is also available in Microsoft Word format.

A modern browser (eg Internet Explorer 7 or later, Google Chrome, Safari 4.0+, Opera or Firefox) is required to view the video. This is a free download from [www.apple.com/quicktime](http://www.apple.com/quicktime). A high quality MP4 version of the video is available on CD-ROM or download from the SPICE website.

## Activity summary

ACTIVITY	POSSIBLE STRATEGY
Students enter their thoughts about water recycling and replenishment, in the INITIAL REASONING: What do you think? box on their Student reporting sheet.	individual
Class discussion about prior knowledge/ reactions to water recycling and water replenishment. See <b>Teacher notes</b> below.	whole class
Students watch the video, <i>Groundwater replenishment — Part 4: New water sources</i> .	whole class
Students complete the BACKGROUND RESEARCH box on the <i>Student reporting sheet</i> .  Students may look at other sources to gain further background knowledge, perhaps between stages of the following experiment.	individual
Students do experiment, <i>Water treatment</i> . This will take more than one session to complete. When finished, students enter findings under the heading, SCIENTIFIC EXPERIMENT, on the <i>Student reporting sheet</i> .	small groups then individual
Students design and conduct a survey to find out what other people know and think about water recycling and water replenishment. See <b>Teacher notes</b> below.  When finished, students enter findings under the heading, SURVEY on the <i>Student reporting sheet</i> .	individual or small groups
Students complete the OVERALL CONCLUSION section on their <i>Student reporting sheet</i> .	individual
Students complete the BEST WAY TO PRESENT THIS INFORMATION TO INFORM/INFLUENCE OTHERS section.  Using this information, students create a persuasion piece to influence others about water recycling and replenishment.	individual

## Teacher notes

### Initial class discussion

As a class discuss the following questions to establish what students already know about the topic:

1. What is water recycling?
2. Does anyone recycle any water at home or know any place where recycled water is used?
3. Is it a good idea to recycle water? What are some advantages and disadvantages of recycling water?
4. What is water replenishment?
5. Would you like to drink water that has come from recycling or a replenishment scheme? Why? Why not?

### Experiment information

In the experiment, *Water treatment*, students use a UV light to kill bacteria in their grey water. UV light stops bacteria from reproducing. Ideally the UV light should be in the range 200 – 300 nm for bacteria irradiation, however if this is not available other wavelengths may work to a lesser extent.

### Student survey

Students design, and write down, a survey to find out other people's attitudes toward water recycling and water replenishment. It should ask people about what they know about the topic as well as asking their opinions.

Answers to the survey questions could be written or recorded as a vox pop (spontaneous interviews with members of the general public or their peers).

After completing the survey, students should process data and look for patterns in the results. For example: Is there correlation between lack of knowledge about water recycling and reluctance to drink recycled water?

Students represent their findings in suitable ways, e.g. graphs.

### Persuasion piece

Students organise their thoughts and findings, into a persuasive presentation piece, to convince others to share their thoughts on water recycling and replenishment.

This piece could be a poster, newspaper article, video, presentation, debate or other suitable medium. In it, students should share their opinions, supporting them with background research, experimental evidence and survey responses where possible.

## Acknowledgements

Thanks to Emily Rockwell, Team Leader Education, Customer and Community Group, Water Corporation of Western Australia.

Designed and developed by the Centre for Learning Technology, The University of Western Australia.

Production team: Designed and developed by the Centre for Learning Technology, The University of Western Australia. Production team: Anton Ball, Jan Dook, Alwyn Evans, Bob Fitzpatrick, Sally Harban, Dan Hutton, Paul Ricketts, Kate Vyvyan and Michael Wheatley, with thanks to Jenny Gull and Wendy Sanderson.

banner image: 'Water drop before impact' by Roger McLassus, GFDL, [http://commons.wikimedia.org/wiki/File:2006-02-13\\_Drop\\_before\\_impact.jpg](http://commons.wikimedia.org/wiki/File:2006-02-13_Drop_before_impact.jpg)

## SPICE resources and copyright

All SPICE resources are available from the Centre for Learning Technology at The University of Western Australia ("UWA"). Selected SPICE resources are available through the websites of Australian State and Territory Education Authorities.

Copyright of SPICE resources belongs to The University of Western Australia unless otherwise indicated.

Teachers and students at Australian and New Zealand schools are granted permission to reproduce, edit, recompile and include in derivative works the resources subject to conditions detailed at [spice.wa.edu.au/usage](http://spice.wa.edu.au/usage).

All questions involving copyright and use should be directed to SPICE at UWA.

Web: [spice.wa.edu.au](http://spice.wa.edu.au)  
 Email: [spice@uwa.edu.au](mailto:spice@uwa.edu.au)  
 Phone: (08) 6488 3917

Centre for Learning Technology (M016)  
 The University of Western Australia  
 35 Stirling Highway  
 Crawley WA 6009

## Associated SPICE resources

*Water 4: Recycling water* may be used in conjunction with related SPICE resources to to teach the topic of water supplies in Western Australia.

DESCRIPTION	LEARNING PURPOSE
<p><i>Water (overview)</i></p> <p>This learning pathway shows how a number of SPICE resources can be used in teaching students about how Western Australia secures its water supply.</p>	
<p><i>Water 1: Finding water</i></p> <p>A video shows a range of potential ideas for how water could be supplied to people living in Western Australia.</p>	<b>Engage</b>
<p><i>Water 2: Water sources</i></p> <p>Students use an interactive learning object to explore water sources in a number of regions across Western Australia.</p>	<b>Explore</b>
<p><i>Water 3: Water supply</i></p> <p>Students play a board game to investigate the economic, social and environmental factors that must be considered when planning a sustainable water supply.</p>	<b>Explain</b>
<p><i>Water 4: Recycling water</i></p> <p>Students investigate the Water Corporation's groundwater replenishment scheme by conducting background research, an experiment and a survey.</p>	<b>Elaborate</b>