

2006 MALLEE EDUCATION PROGRAM

Groundwater and Water Conservation

ACTIVITY 1: GROUNDWATER SUPPLIES

As a class, do a survey of the number of bores your families have on their properties.

What are the bores used for?

- Domestic (home)
- Stock
- Irrigation
- Other

Do your parents have other information for the bores?

For example:

- Year the bore was drilled
- Location of the bore on a map
- Type of pump used
- Depth to groundwater
- Salinity level

Summarise the information for your class using diagrams, tables and graphs, to show your results.

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ACTIVITY 2: WATER-SAVING APPLIANCES

The National Water Conservation and Rating and Labelling Scheme is a voluntary scheme that allows buyers to identify water efficient products such as shower heads, dishwashers and washing machines with a rating system.

As a class, do a survey of the appliances in your homes and collect data on how many appliances your class has in each category?

- 0 – no label
- 1A – moderate level of water efficiency
- 2A – A good level of water efficiency
- 3A – A high level of water efficiency
- 4A – A very high level of water efficiency
- 5A – An excellent level of water efficiency

Enter your class information into an Excel spreadsheet and experiment with different styles of graphs, to show your results.

You might also like to ask several other classes in your school to do the same exercise and compare the results.

Or you could do a summary of all of the results to show the results for your community. **REMEMBER – if you do add all of the results together for your community, if children from one family are in different classes, only count each family once.**

Teachers note: Scaling for previous labeling system

The current rating system with 5 As came about following an earlier rating system. The students may find that their labels look more like the ones below (with only 3 As):



If this is the case, the categories equate as follows:

- 1A = 2A under current system
- 2A = 3A under current system
- 3A = 5A under current system

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ACTIVITY 3: DESIGN YOUR OWN WATERWISE STICKERS OR MAGNETS

Design stickers or magnets with a water saving message. You can use the example slogans below, or make up your own. Be sure to include some clear and colourful illustrations to make your message clear.

- Don't be a mug....use the plug!
- Water. Use it....don't abuse it!
- No jest.....a full load is best!
- For a garden that's a ripper.....install a dripper!
- A weekly soak they say....beats a sprinkle every day!
- Reduce the gush....use a half flush!
- A leaky loo....costs you!

ACTIVITY 4: RESEARCH GROUNDWATER

Can you find the answers to the following questions:

- What percentage of the Earth's total water does groundwater make up?
- What do porosity and permeability mean?
- What is the water table?
- How is a confined aquifer different to an unconfined aquifer?
- Are there plants or animals that live in groundwater?
- What is recharge?
- How can groundwater become contaminated? Is this likely to be a problem in the Mallee? (Hint: Think about the depth to the water table and how quickly or slowly recharge occurs)
- What is drawdown?

www.groundwater.org might be a good place to start

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ACTIVITY 5: MR TAYLOR'S TOILET

Mr Taylor lives in an old farm house, which was built before dual flush toilets were available. He cannot really afford to buy a whole new toilet and cistern and he is looking for some ideas on how to save water in his toilet without buying a new one.

1. Read the information on the next page about how a toilet works
2. Design a way that Mr Taylor can test how much water his toilet is using per flush
3. Make some suggestions for Mr Taylor, about how he might be able to save water in his toilet.
4. Can you think of any reason why it might be a bad thing for Mr Taylor to reduce the amount of water his toilet uses per flush?

(CAUTION: If you have a single flush toilet at home, don't try out your ideas without first getting your parent's permission)

Hints:

The volume of water needed to empty the bowl can be greatly reduced by the shape of the bowl.

Water stops filling the cistern when the water level is high enough to activate the float valve.

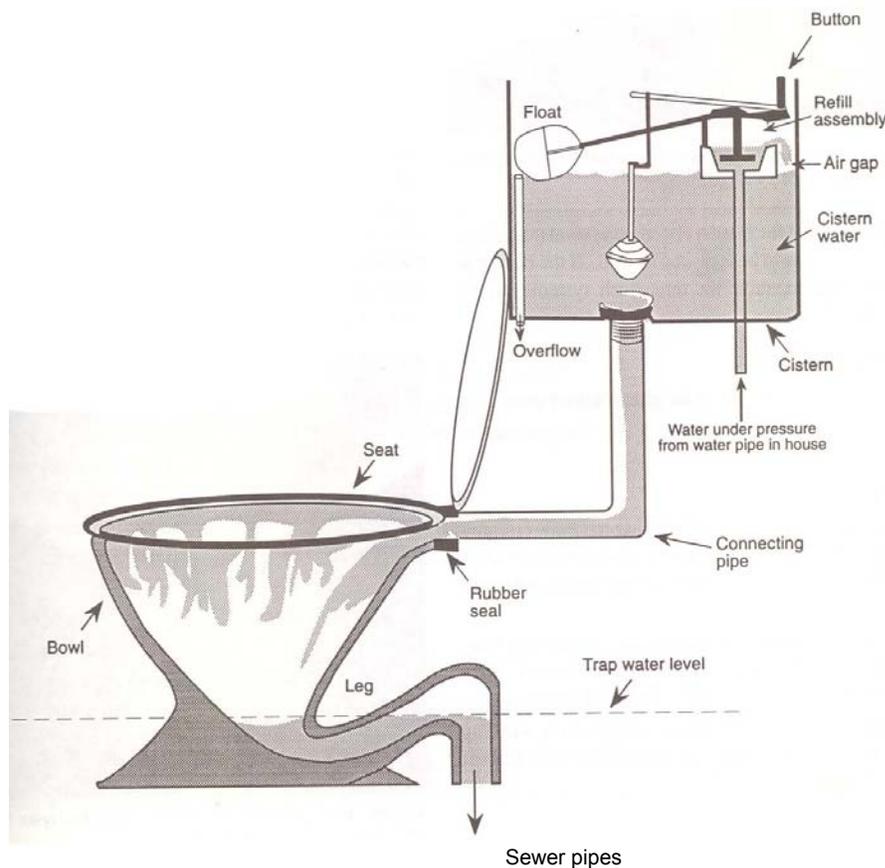
TOILET

The toilet works by flushing a **bowl** from a reservoir called a **cistern**. The cistern refills with water after the toilet has been flushed. (See the cross-section below).

Water enters at the top of the cistern under pressure from a water pipe in the house. It passes through a refill assembly containing a valve controlled by a float on the end of a rod. The refill assembly delivers water only when the water level in the cistern is not high enough to turn the valve off. When the toilet is flushed, a plunger at the bottom of the cistern opens and releases the water into the bowl. This forces the water in the bottom of the bowl down and up past the toilet leg, allowing it to fall by gravity to the sewer pipes below.

The shape of the toilet leg ensures a quantity of clean water remains to form an air trap in the bottom of the bowl. This prevents odours from the sewer system entering the house.

After flushing the toilet, when the cistern is emptied, the plug at the bottom of the toilet cistern closes stopping any further water from leaving the cistern. As the water flows out of the cistern, the float drops, which opens a valve on the in-coming water pipe that is connected to the cistern. Water then refills the cistern via the refill assembly – until the float is lifted to the correct height to close the valve and stop the incoming water.



Note:

In a dual flush system, you have the choice of either a full or half flush. Older toilets flushed with 24 L of water. The first dual flush toilets used a system of 12 L full and 6 L half flush. New systems use 6 L full and 3 L half flush.

If installing a dual flush toilet cistern, you need to check if the bowl needs to be replaced as well. If the bowl and cistern are not compatible, the dual flush system will not work correctly.

Source:

Moffatt, B (1993) *WaterWise: Water resource management and conservation for Senior Students*, DPI Queensland

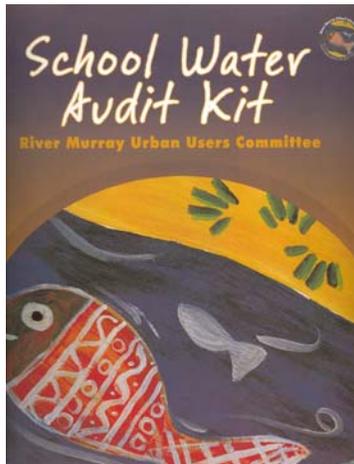
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KESAB WATERCARE CLUB

This site has an interactive explanation of groundwater and associated terms. It addresses some of the issues with groundwater management and how it relates to freshwater sources.

www.cwmb.sa.gov.au/kwc/interactive/groundwater/index.htm

RIVER MURRAY URBAN USERS SCHOOL WATER AUDIT KIT



An excellent resource with a great variety of activities around water conservation, divided into Year Bands.

The front cover looks something like this.

Each school in South Australia was sent a copy in 2004, so check your Library or Staff Resources section.

If you can't find the folder, parts of the resource can be downloaded from the website below:

www.murrayusers.sa.gov.au/waterauditkit04.htm

THE GROUNDWATER FOUNDATION Kid's Corner

Basic explanations of groundwater terms and facts. A range of activities and worksheets for students to further explore the groundwater topic.

www.groundwater.org/kc/kc.html