Above Ground Water Sources - Teacher's Notes

Rain is the initial source of fresh water
Sunshine evaporates fresh water from salty sea water. When the water vapour rises it cools, forms clouds and then rains fresh water.

Making Rain - Teacher Demonstration

Materials

- A zip lock sandwich bag.
- Hot (but not boiling) water.
- A basin or large beaker of very cold water. Adding ice cubes helps speed up condensation.

Method

1. Prepare the bath of cold water.
2. Pour in enough hot water to half fill the bag.
3. Zip lock the bag.
4. Holding the bag by the zip, lower it into the icy cold water.
5. Observe.

Observation

Water vapour from the hot water condenses on the cold sides of the bag and forms liquid droplets.

Rainwater must be collected together to form a large reservoir and transferred to where it is needed. Surface runoff collects in low-lying areas creating rivers and lakes, which can be used as reservoirs. To stop water flowing away to sea, these areas can be dammed. Farmers make soil walls across winter streambeds, and line them with clay, to stop water seeping into the soil. These are called "turkey's nest dams" in the south of WA or "tanks" in the north.

Above Ground Water Sources - Teacher's Notes

Teacher's jokes What did the fish say when he swam into the wall at the end of the lake? DAM!
What did the frog say when summer had left him only 2cm of water in his pond? Knee deep!

Water Always Flows Downhill - Student Activity

In Science we always test our ideas to make sure they work. This activity is best done outdoors.

Materials per student or group

- A sloping waterproof surface such as a cement ramp or tilted plastic tray.
- A straw, Pasteur pipette or small containers for holding water. (Dip the straw into water, place a finger firmly over the top of the straw and the student can carry water in the straw).

Method

1. Students hold the water container (straw or pipette) one hand's height above the sloping surface.
2. On a count of three they gently pour or release the water onto the surface.
3. The direction of water movement is observed and a tally of all students' results are entered into the table provided

Direction of water movement

	Up slope	Down slope	Across Slope
Student observation tally		卌 卌 卌 卌	
Total	0	20	0

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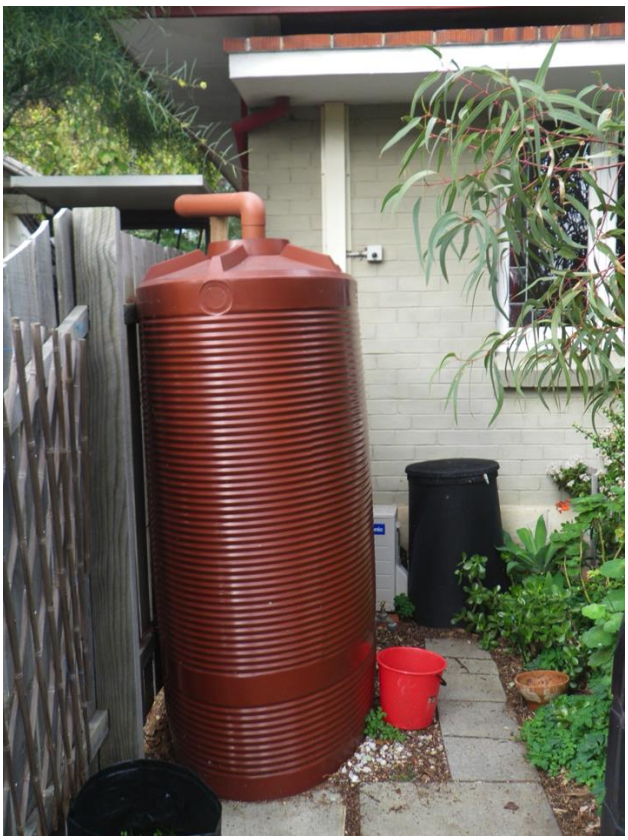
Which way does water flow? Down slope/downhill.
Why is there always a hollow or depression around a drain in the schoolyard? To drain away the rainwater.
Why isn't the bottom of your shower at home flat? To allow the water to drain away.
Why do some areas of the schoolyard always have puddles? They are low lying and don't have drains.

Rainwater Collectors – Man-made and Natural

What is the source of water in this tank? Rain from the roof.



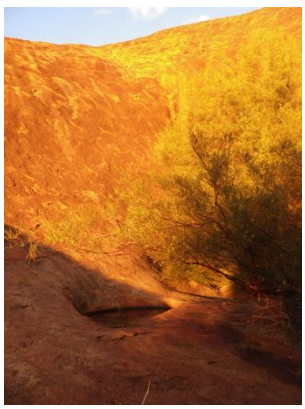
Rainwater can be collected directly from house roofs and downpipes and directed into rainwater tanks for storage. Water is filtered before entering the tank to remove any dead leaves or material from the roof and to prevent birds, frogs and lizards from entering. These tanks also often have screens to prevent insects, such as mosquitos and flies, from contaminating water. When properly maintained this water is good for most household and garden purposes.

More information on domestic rainwater tanks can be found at: https://www.healthywa.wa.gov.au/Articles/U_Z/Water-tanks-on-your-property

Above Ground Water Sources - Teacher's Notes

In country areas that depend on sourcing "hard" bore water for most of their needs, rainwater is highly prized for drinking, cooking and rinsing washed hair (which leaves it silky and not curiously crunchy).
In rural India, most households are primarily dependent on roof rainwater for all household needs. A large cistern is constructed under each house to hold all their private supply.
An excellent short (17m 14s) talk on TED explaining an Indian perspective on water collection can be found at:
https://www.ted.com/talks/anupam_mishra_the_ancient_ingenuity_of_water_harvesting?language=en
It has recently become possible to buy huge plastic membrane bags that can be inserted under our Australian houses to hold rainwater in a similar fashion. They are insulated from the Sun's heat by the mass of the house and are sealed to reduce evaporation. (Mending leaks can be problematic however).

Rainwater falling over large rocky outcrops or areas of concrete can also be collected as runoff into town dams. The rock or concrete does not allow the water to penetrate into it and a clay or asphalt base stops it seeping underground. In this way rainwater falling on a large area of the ground is directed into a smaller holding dam.
Early settlers and Aboriginal people also used runoff from large rock outcrops. Rain would run from large areas of rock and be channelled towards ground level by natural cracks in the rock. At Walga Rock in the Murchison region, water is seen trapped in a natural hole in the rock which Aboriginal people have widened and again further down slope in a water hole with a clay base.
For water to collect there needs to be a waterproof surface. In nature this is usually clay or rock.



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Above Ground Water Sources - Teacher's Notes

Collecting Rainfall - Student Activity

Materials

- A piece of plastic, such as a garbage bag.
- Two cups/jars of the same size.
- A watering can or empty cool drink bottle with its bottom perforated by thumbtack holes.
- Measuring cylinder or jug or a teaspoon (each teaspoon contains 5mL)
- Water
- Garden or sandpit

Method

1. Sink both cups (or jars) into the garden or sandpit until their tops are at ground level
2. Place the plastic over one cup and perforate the center (as in the picture) pushing it into the center to create a funnel.
3. "Rain" equally over both cups and collect water in cups.
4. Measure how much water each cup has collected.

The cup collecting rain from a greater area will contain most water.

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