

Lesson Plan 1: Grades 3 - 4

Getting to know Dams, Weirs and Water Channels

Context

Dams: A dam is a big wall constructed across a valley to control the flow or raise the level of water held within a catchment area.

Currently, SunWater owns and manages nineteen dams in Queensland and each dam has been strategically built in existing river, stream or creek locations to serve the needs of the region. A dam is a critical component of a water supply scheme which can be made up of weirs and barrages, pumping stations, pipelines and channels, and drains. The overall scheme is designed to supply water for various purposes including town water supply, irrigation, electricity production, industrial i.e. power stations, mines, stock and groundwater supply.



Dams are also a great place to visit to enjoy recreational activities, however there are risks associated with dams which are important to understand, particularly if you are a resident living downstream of a dam.

In the event of heavy rainfall in a dam catchment area, a dam will provide some attenuation (reduction) to flooding downstream of the dam. However, as the dam's storage level increases and reaches its full supply level, excess water is diverted through a spillway to flow downstream.

SunWater dams are designed to store water to their intended capacity and then safely pass any excess water inflows through purpose built spillways, release gates or outlet works

For more information about dams, please refer to the [SunWater Dam brochure](#).

Weirs: Over the last 80 years, SunWater has designed and managed the construction of 66 weirs and barrages. A weir is a steel or concrete barrier constructed across a river or creek that regulates water flow and allows water to be slowly released to users downstream. Due to the unpredictable nature of water release, weirs can be very dangerous with strong undercurrents and hidden debris that cannot be seen.

Water channel: A water channel is like a passage dug into the ground to send water from one location to another for farmers to use to water their crops. Water levels in channels can change very quickly. Heavy gates let water in and out of the channels causing the water levels to rise and fall. The sides of water channels are often very steep and algae present in the water can make the sides of the water channels slippery. Just like dams and weirs, there are also pipes under water in channels that cannot be seen from the surface.

Teacher's note: Please colour print and laminate the three flash cards showing a dam, weir and water channel for use in this lesson plan. Print double sided to reference the fast facts.

Learning Outcomes

- Understand the difference between dams, weirs and water channels through classroom discussion
- Appreciate that dams are a great place to enjoy recreational activities while, at the same time, having an awareness of the potential dangers
- Understand the purposes of dams, weirs and water channels and how the water supply is used
- Respond to and pose questions about familiar and unfamiliar events

Class discussion & activity

- Engage the students in a class discussion about where water comes from when we turn a tap on at home. Introduce the term dam and ask the students to describe what a dam is and why we need them. Write down key words on the board.
- Discuss how the water got into the dam (introduce the concept of the water cycle) and what would happen to the level of water in the dam after long periods of rain and long periods of dry weather.
- Ask students to think about the various uses for the water, and who might use it (e.g. towns, farmers, industry etc.)
- Ask the students if they have ever visited a dam. What did they do while they were there? Write down some of the recreational activities that could take place at dams.
- Introduce the term weir and water channel. Using the flash cards, show the pictures to the students and ask them to identify the main similarities and differences between dams, weirs and water channels.
- Explain to the students that dams, weirs and water channels can be dangerous places too. Ask the students to think of some of the dangers that could be present.

Teacher's note: This topic is covered in further detail in Lesson Plan 2: *Understanding the hidden dangers- what lies beneath?*

- Introduce the activity sheet: **Discovering dams, weirs and water channels** and ask the students to complete the activity.

Links

Sun Water website	http://www.sunwater.com.au/
Play Safe... Stay away! video	http://www.sunwater.com.au/sustainability/water-safety/blue-safety-video
Splash Facts	http://www.sunwater.com.au/sustainability/water-safety/blue-safety-video/teach-me!
Safety Tips when visiting a dam-brochure	http://www.sunwater.com.au/_data/assets/pdf_file/0007/16864/Safety_tips_when_visiting_a_dam.pdf
A3 full colour classroom posters	http://www.sunwater.com.au/_data/assets/pdf_file/0012/2622/Water_Safety_A3_Poster.pdf
SunWater dams brochure	http://www.sunwater.com.au/_data/assets/pdf_file/0005/17465/Sun_Water_Dams.pdf
SunWater infrastructure map	http://www.sunwater.com.au/_data/assets/pdf_file/0018/1728/Sun_Water_Infrastructure_Map_2016.pdf
Free 'Blue Pack'	http://www.sunwater.com.au/sustainability/water-safety/blue-safety-video/for-teachers

All URLs and hyperlinks correct at May 2017

Reflection & extension

Discuss the water cycle in more detail. Explain how water is recycled over, and over again. Describe the journey of a water drop as it is heated by the sun (evaporates) and travels from the ocean up into the sky as water vapour. As the water vapour rises, it cools (condenses) and the water drops form clouds. As the water drops become heavier, they will fall back onto the land and rivers as rain, snow or hail (precipitation). Some of this rainwater is captured and stored in dams so that it can supply water to towns, farms and industry; some of the water enters creeks and rivers; and some soaks into the ground and travels through the soil as groundwater. Eventually the water return to the ocean where the water cycle starts again.

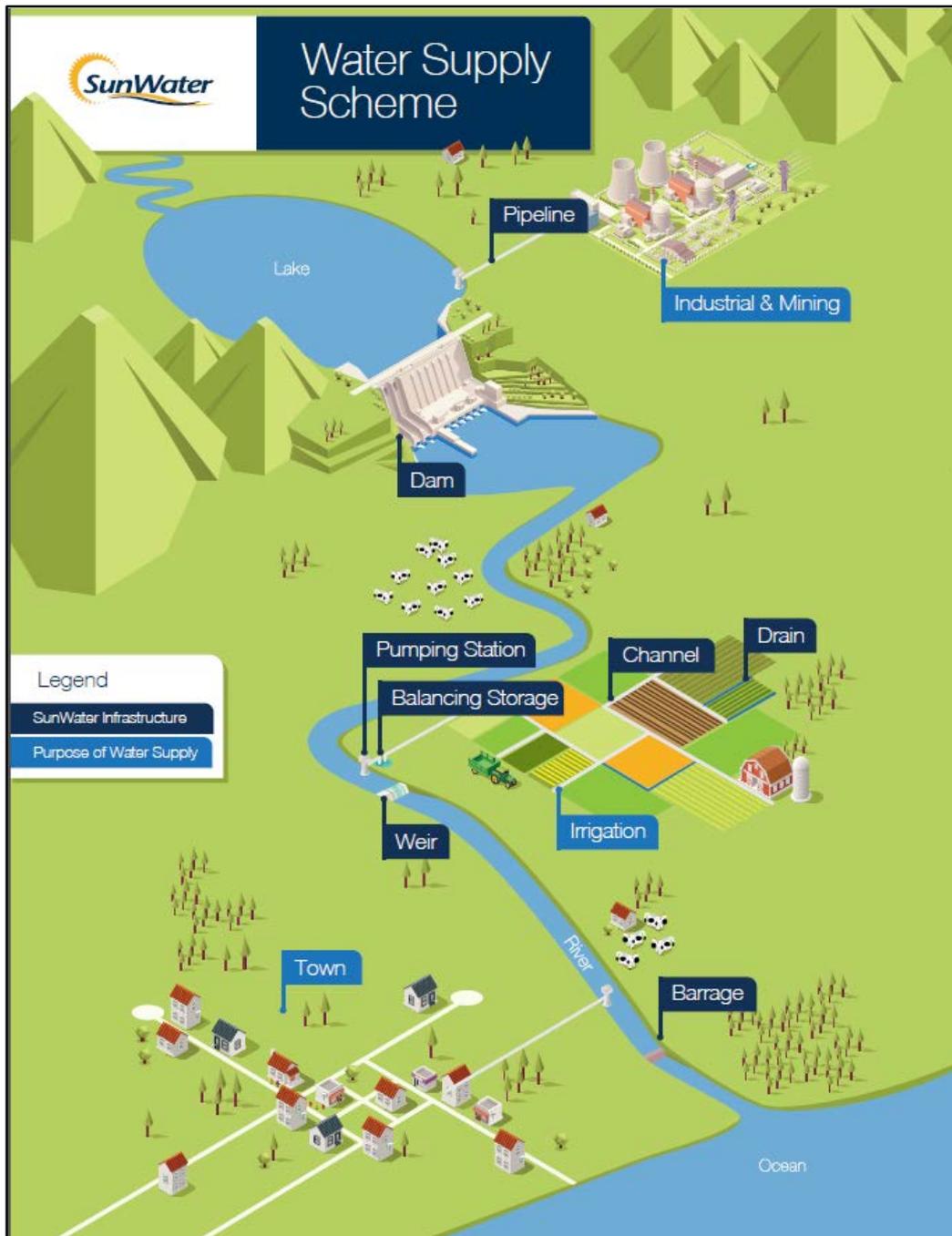
Ask the students to research the water cycle via the internet or library. Ask the students to draw and label a simple diagram of the water cycle. The students should draw arrows to demonstrate the movement of water around the cycle, and annotate their diagram with the following key words.

ocean	evaporation	sun	water vapour	cools/ condenses
precipitation/ rain	lakes	dam	river/ creeks	groundwater



Activity sheet: Discovering dams, weirs and water channels

- The picture below shows how the water supply is used between the lake and the ocean. Use the picture to help you to fill in the blanks in the passage of text on the next page using the words provided in the table.





Fill in the blanks:

When it _____ water enters rivers and _____. These eventually flow out to the _____. Some of the water soaks into the _____, this is known as groundwater.

A _____ is a big wall that is built across a valley. A large _____ is formed behind the dam wall. A dam helps to _____ the flow of water or raise the level of water held within a _____ area.

Dams play a very important role in supplying water to _____, farms and industry. We use the water in our _____ and schools, and farmers use the water to _____ their crops.

During periods of heavy rain, the _____ levels in the dams will _____. Water is safely released from the dam via a _____ or release gate.

A weir is a _____ built across a river or creek to control the flow of water that is released to users downstream. The main difference between a dam and a _____ is that water flows over the top (crest) of weir and not through a release gate or spillway.

A _____ _____ is like a passage dug into the ground. It sends water from one location to another for _____ to water (irrigate) their crops.

Playing in dams, weirs and water channels can be very _____. It is important to pay attention to the _____ signs and follow directions.

Use these words to fill in the blank spaces:

dam	towns	weir	creeks	lake
water	rains	homes	spillway	rise
control	barrier	ground	water channel	warning
dangerous	catchment	farmers	irrigate	ocean

2. Write the word **Dam**, **Weir** or **Water channel** to match each picture below.



3. The 'Water Supply Scheme' picture shows the water supply being used in towns, by farmers, and in industry and mining. Write a couple of sentences describing how the water could be used in each of these areas:

Towns:

Farmers:

Industry (e.g. mining and factories)

4. In periods of dry weather (drought) the water levels in the dam will fall. What steps could we take to try to save (conserve) water in periods of drought? Write down four ideas below.

a. _____

b. _____

c. _____

d. _____

