

## Spring has sprung

It never fails to amaze me to see or hear how children value the natural environment. Many of them, some as young as three or four years old know plenty about it and even more encouragingly, they care deeply about it as well. I cannot recall how young or perhaps more pertinently how old I was when I first heard the word 'environment' but I am sure I was a lot older than the great majority of students these days. It is very encouraging to hear them talk so passionately about nature, to value it and to enjoy being in it.

Many of you have taken your classes in recent years to the Rainforest School at Pukeiti. If you have been there recently, you will see big changes afoot with lots more in the pipeline. It's all very exciting but unfortunately some of the activities listed in our Rainforest School study unit are not available at present. But please don't be put off as many of the listed activities are unaffected. The new education programmes at our other regional gardens, namely the Woodlands School at Hollard Gardens and the Riverside School at Tupare, have had their first visits from school groups. The visits were very successful; each venue offers different activities from Pukeiti and for that matter from each other. Please do not hesitate to get in touch should you wish to visit any of them.

Rocky shore studies are especially popular in terms one and four. School visits to these areas are dependent on suitable low tides and it is not always possible to get dates and times to suit your needs. However there is a better chance of getting support from me, if you enquire a long time in advance. For the benefit of other educational groups that have more flexible working hours, I am often available outside of normal school hours and even on some occasions, on weekends.

This year the theme for Get Ready Week is Prepared Kids. The Ministry of Civil Defence Emergency Management (MCDEM) is launching its redeveloped schools resource 'What's the Plan Stan?' on 10 October as part of Get Ready Week 2016.

The new resource is designed to encourage schools to update their emergency preparedness plans and to build resilience as a life skill for their students. The aim is also for students to encourage their families to be more prepared. If you need support with any part of this, please get in touch.

Have a great term.  
Kevin

## SHMAK in secondary schools

In today's world, where the use of acronyms seems to be part and parcel of modern-day living, SHMAK (Stream Health Measurement and Assessment Kit) is just one you possibly have heard of.

This issue of SITE (another acronym) explains how and why the SHMAK programme originated, how we have adapted it to use in our streams and rivers and how we can support you, if you wish to use it with your senior science classes.



## Taranaki Science and Technology Fair



The Taranaki Science and Technology Fair once again provided an opportunity for local students from Year 7 and above to display their extraordinary range of talents. Each year the Taranaki Regional Council sponsors prizes for displays that exhibit an aspect of environmental science. The high quality of this year's displays made judging them a very difficult exercise and our congratulations go to all exhibitors for their terrific entries.

This year, Taranaki Regional Council prizes were awarded to :

**First prize** - Kelan Alexander and Hayze Carr-Rewi (NPBHS), for their scientific investigation titled *How to get Un-oiled*. Kelan Alexander and Hayze Carr-Rewi's (NPBHS) winning display with its rather unusual title showed the results of their extensive oleophilic testing to determine what materials soak up oil effectively and which ones don't. Fantastic work guys.

**Second equal prize** – Connor Dillon (Highlands Intermediate), for his scientific investigation titled *Water Quality*.

**Second equal prize** – Andrew Boot (NPBHS) for his scientific investigation titled *Nitrate Leaching*.

# SHMAK (Stream Health Measurement Assessment Kit)

The SHMAK was originally designed by NIWA (The National Institute of Water and Atmospheric Research) in Christchurch, primarily to assist dairy farming landowners in Canterbury to monitor the 'health' of the streams that flow across their land.

The SHMAK is not used extensively in Taranaki as the Taranaki Regional Council does extensive monitoring of the water quality in our streams through our State of the Environment and other programmes.

## SHMAK testing

Eight years ago, we extensively tested SHMAK in a number of our rivers and streams with the aim of making it available to use with Year 12/13 science classes in our region. We believed that its use at that level would assist students as a part of their Scientific Investigations of the Living World.

Following the tests, we adapted the kit to Taranaki conditions, modifying the method of identifying and counting the macroinvertebrates found in the water. SHMAK enables us to build on the skills of the hundreds of primary and intermediate students in our region who have been involved in water quality studies over a number of years.

### *What does stream health actually mean?*

'Stream health' refers to the condition of the whole waterway. Monitoring stream health involves looking at the water quality and checking out the physical features of the stream and the plants and animals that live there.

### *What does 'monitoring' mean?*

'Monitoring' is about checking and keeping records of the results so they can be compared over time.

### *What role does the 'assessment' have?*

Assessment means giving scores to each monitoring activity and using them to assess the condition of the stream at any given time.

## Schools studying local streams

Our water quality programme, prior to the introduction of SHMAK focused on finding and correctly identifying as many invertebrate species (taxa) as possible, with their presence or absence providing us with valuable information as to the water quality. We also used relatively simple activities such as water clarity testing and water temperature readings to support our results.

This programme is still operating and is very popular with primary, intermediate and Years 9-11 secondary classes.



NPBHS Science Students



Checking water temperature

## SHMAK Stream Habitat and Biological Sampling

Under the heading of Stream Habitat, SHMAK uses water clarity testing, water temperature reading, measuring the water velocity, recording the water pH and the water conductivity, assessing the composition of both the stream bed and the bank vegetation and identifying any loose deposits on the stream bed. While some of these activities are relatively straightforward others, particularly the assessing the streambed composition and the vegetation on the streambank, are more difficult and can take time and practice to achieve accuracy.

The biological component involves finding and correctly identifying as many species of macroinvertebrates as possible.

## SHMAK suitability

The SHMAK is designed for use in all types of streams, from those with mainly stony streambeds through sandy and silty streambeds.



## Council support

For teachers using SHMAK with their classes:

- Kevin can run an after-school or if needed, a weekend training session for teachers at your school. This training involves a PowerPoint presentation about SHMAK followed by a practical session at a local stream. This session usually takes about three hours and teachers attending would then be welcome to borrow our SHMAK for a day. There is no cost involved.
- Kevin can work with a class and its teacher for a day following the same programme.
- Download the SHMAK study unit from the Council website [trc.govt.nz](http://trc.govt.nz)

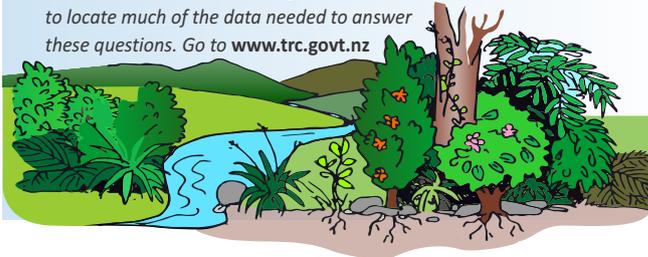




## Research

1. Name six rivers or streams near to your school.
2. How did they get their names?
3. What do the names mean?
4. Locate the source (start) of each stream or river, follow its course and where it ends?
5. Do any of your streams and rivers have other streams that run into them (tributaries)? If yes, can you name any?
6. Classify your streams or rivers as being mainly stony, mainly stony and sandy, mainly sandy and stony, or mainly silty.
7. Are you aware of any fish life in your streams and rivers? If so what species could you expect to find in each of them.
8. Find the highest and lowest water levels of each of your streams and rivers over the past 12 months.
9. Have any of your streams and rivers been the subject of any historical events such as major floods or extremely low flows. If so, when?
10. Visit one or two of your local streams and rivers and access their water quality by using your senses, except taste.

Please note – the Taranaki Regional council website could be used to locate much of the data needed to answer these questions. Go to [www.trc.govt.nz](http://www.trc.govt.nz)



## Messages about freshwater

Pair the words on the left with the matching statement on the right

- |              |   |
|--------------|---|
| 1. Share     | A – The Egmont National Park                  |
| 2. Take care | B – The habitat of fish and other stream life |
| 3. Conserve  | C – Think of other people's need for water    |
| 4. Protect   | D – Don't use more than you need              |
| 5. Respect   | E – Don't pollute water with wastes           |

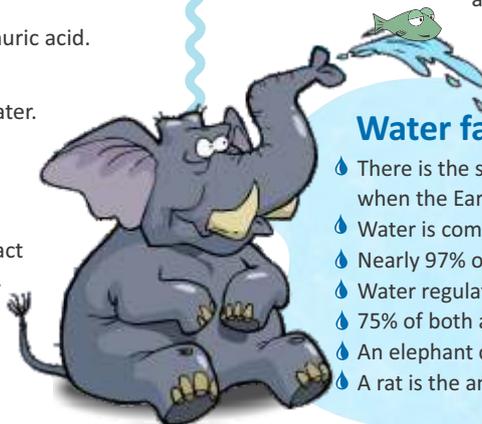
## True/False water statements

You will be doing really well to get all ten of these statements correct. But, give it a go and the best of luck to you. If it is any consolation, Mr Archer only got 8 correct! Surely you can do better than he did!

### Helpful tip:

There are two more false statements than true ones.

1. Like most liquids, water contracts (gets smaller) when it freezes.
2. Condensation is water coming out of the air.
3. More things can dissolve in water than in sulphuric acid.
4. Rainwater is the purest form of water.
5. Seawater is slightly more alkaline than fresh water.
6. Water boils more quickly at the beach than it does at the top of a mountain.
7. Raindrops are tear-shaped.
8. Rainbows have colours because the raindrops act as mirrors and reflect light directly back to you.
9. Pure water does not conduct electricity.
10. If the relative humidity in the air is 100%, water will not evaporate into the air.



## Water word search

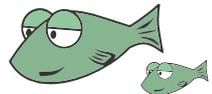
W E W W J Q F H W S T S O H N E C M  
 F A C M G I C H T U I P C X Z O Y I  
 R R V I K C I E S U D L E S L N L W  
 E Z E E P N A V T D E A A D I A Y S  
 I G I V O M I N J G T S N A G I G W  
 C K J G I B I R I O D H R L I A R E  
 A H U S C R W M D A H N U O M K E T  
 L C N E Z W E L C E R P I O O V B Q  
 G K O A H K B G S Z C D B P P J E X  
 Z Y I N D I U Q I L C G P W J K C L  
 S W C F H Y A J L W C R G T A Q I K  
 K Z G G W R Y X E L T T O B Y R T P  
 P I R D X S S J U U T Y M V K U N E

BOTTLE	GLACIER	POOL	STEAM
COLD	ICE	RAIN	SWIM
DRAIN	ICEBERG	RIVER	TIDE
DRINK	LIQUID	SEA	WAVE
DRIP	OCEAN	SPLASH	WET

## Jumbled water words

The letters in the word 'WATER' are contained in each of these answers jumbled words. The meanings of the words are given, the first letter of the answer is in red and the last letter of the answer is in green.

1. **TTUAERWC** – a species of Atlantic seabird
2. **AAGETRWE** – money paid for transporting water
3. **GNIRETAWHTUOM** – very enticing food is this
4. **OLERAWGEGDT** – full of water
5. **KTAERWMRA** – a mark which shows what height water has reached
6. **BRETAACKW** – an isolated and peaceful place
7. **HTERWAEDAS** – an area close to the start of a river
8. **SREIDWRTEA** – a former name of a person who worked on a wharf
9. **GWARETLOD** – the surname of a former USA presidential candidate
10. **WWAATTRSEE** – water that has been used for washing, bathing and sewage disposal.



## Water facts that might surprise you

- There is the same amount of water on Earth today as there was when the Earth was formed.
- Water is composed of only two elements, Hydrogen and Oxygen.
- Nearly 97% of the world's water is salty or otherwise undrinkable.
- Water regulates the Earth's temperature.
- 75% of both a human brain and a living tree is water.
- An elephant can smell water up to five kilometres away.
- A rat is the animal that can survive the longest without water.



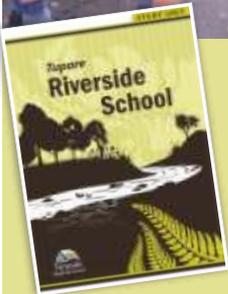
Students and parents from the Freedom education group in New Plymouth checked out the fauna and flora at Barrett Lagoon as part of their wetlands study in August.

# This and That

## Get Ready Week 2016: 10 - 14 October

This year the theme for Get Ready Week is Prepared Kids.

For more information see the paragraph in the editorial on page 1. Or visit [www.getthru.govt.nz](http://www.getthru.govt.nz)



## Francis Douglas Memorial College visit the Riverside School at Tupare Gardens.

Students from Jeanne Marshall's (Francis Douglas Memorial College) Year 10 horticultural class listen to Tupare's Senior Gardener, Mitch Graham during their recent visit. The students enjoyed an informative garden walk, learned all sorts of handy horticultural tips and had fun deciphering the clues in the garden rally.



## Ngamatapouri School stream study

Students at this small country school enjoyed the chance to investigate the invertebrate life in a small stream adjacent to their school. They also checked the water clarity and water temperature. Thanks for a fun day Ngamatapouri School.



## Country Schools Science Extravaganza

New entrants to senior students from Huirangi, Urenui, Lepperton and Tikorangi Schools joined forces and displayed some wonderful exhibits at their recent Science extravaganza held in the Huirangi Hall. This display, by students from Steve Wright's Urenui class highlights the need for us to keep our oceans clean. Congratulations to all the students for the wonderful displays and to the teachers who organised the extravaganza.

## Answers from page 3

**Messages about fresh water**  
1-C, 2-E, 3-D, 4-B, 5-A

**True/False statements**  
1.False 2. True 3. True 4. False 5. True  
6. False 7. False 8.False 9. True 10. False

**Jumbled water words**  
1. cutwater 2. waterage 3. mouthwatering  
4. waterlogged 5. watermark 6. backwater  
7. headwaters 8. watersider 9. Goldwater  
10.wastewater

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