

EcoBuzz

EcoBuzz Edition 48

Term 4 2012

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Stream Rescue
Tasman School
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Dying animals!
And more



Broadgreen students show off their bugs

Kia ora tatou

2012 – Are the children in your care better able to cope positively with an uncertain future? Have you found time in your busy teaching practice to help them become better citizens– skilled and caring of themselves, others and the planet? It’s a tall order but there are so many ways you can go about it, while still meeting all those curriculum requirements.

Think about food for a moment – every food item produced and purchased locally rather than trans-globally improves our air quality and reduces future carbon dioxide induced climate change because of reduced fuel-guzzling transportation. It supports our local economy because our money stays in the community. It enhances our health because we can access the freshest food grown with knowledge of how it is grown, and it strengthens the community social fabric as our food becomes more than just something to fill our bellies. By bringing food and the business of food closer to home we increase our control over our food, our knowledge of how our food is produced, and the sustainability of our access to healthy food.

So how are the school vegetable gardens an opportunity to deepen young peoples understanding of how they can make a purposeful, important difference to their world? Is it truly better for you, your class, our community, and the planet to buy or grow our food fresh from the local earth?

You decide. Grab an apple and mull it over. Better still have your class decide.

May term 4 be purposeful and fun, followed by a wonderful holiday.

Thanks Jo, Lindsay, Rob, Adie and Claire



“How do we love all the children of all species for all time?” -Bill McDonough

“They live in wisdom who see themselves in all, and all in them.” —Bhagavad Gita

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The Team

Nelson City Council



Jo Martin
Environmental Education Adviser
Ph. 545 8728
jo.martin@ncc.govt.nz



Lindsey Fish
Enviroschools Facilitator
enviroschools@ncc.govt.nz

Tasman District Council



Rob Francis
Environmental Education Officer
Ph. 543 8484
rob.francis@tasman.govt.nz



Adie Leng
Environmental Education Co-ordinator
Ph. 543 7222
adie.leng@tasman.govt.nz



Claire Webster
Environmental Educator
Ph. 525 0020 (ext 450)
claire.webster@tasman.govt.nz



Top priorities to achieve our vision for Nelson 2060:

In August many people, including some school groups, took part in workshops to decide what we should all do to achieve our vision for Nelson in 2060.

After adding together all the workshop outcomes a snap shot of the top priorities for action include:

How we will work towards the vision:

- We invest time and money to build the capability and capacity of people in the region
- We recognise our leaders, they are valued and well-supported by the community
- We have strong local government leadership
- We have integrated regional planning
- Maori cultural knowledge is used to create sustainable futures

Within 10 years we need to ensure that:

- Sufficient land is protected and available to meet our food growing needs
- Nelson's waterways are clear and healthy with a strong mauri (life force)
- Resilience to change is built into the fabric of our community
- All community members can contribute to decision making
- We have a diverse leadership with all cultures and genders represented

Looking further to the future we want to make sure that:

- We have a low carbon economy that is based on renewable energy sources
- Nelson is a regional and national centre for developing understanding of kaitiakitanga, sustainable development and green industries
- Industries build on Nelson's strengths, provide local resilience and reduce the need for imported goods
- Nelson's communities have all their basic needs met and enjoy healthy, active, lifestyles
- Everyone in our community uses the vision to guide their planning and actions

Nelson 2060 – The Vision

Nelson 2060 is an inclusive city, with a diverse range of residents who can connect easily to each other and to the beautiful place we call home. Our inclusive leadership style supports our unique approach to living, which is boldly creative, ecologically exemplary, socially balanced and economically prosperous.

For more information please check it out on the website,

<http://www.nelsoncitycouncil.co.nz/framing-our-future-towards-nelson-2060>

Stream Rescue: something fishy going on in your waterway?



Can you spot the issue?

A member of the public did. Even though the water looked clear, there was something fishy going on! Noting the time and place, a phone call was quickly made to Council.



Within hours a Council compliance officer investigates and finds many more dead native fish, as well as eels.



The officer's investigations eventually located the source of the pollution. Can you see what might have happened?



The compliance officer was able to identify the chemical, which was running down the drain, causing the death of the fish and eels.



As a result, the company was fined and required to install this notice as a reminder to staff of how important it is to protect our waterways. The stream is still recovering.

If you see something odd in a stream or waterway, take note of:

- When? Date and time
- Where? Which stream, and landmarks such as adjacent roads, addresses)
- What? Unusual smells, colour of water, dead fish – anything odd!

Photos can be a big help too!

Then report it to Council: Nelson City Council, 546 0200 or Tasman District Council: 543 8400. You can be anonymous but the sooner your concerns are reported the sooner the stream's health and aquatic life can be helped. Thanks.

TOTSEE teacher PD workshops



‘Teachers as beginner gardeners’ was the topic for the third workshop brought to you by the Top of the South Environmental Educators group (TOTSEE) in term 3.

The afternoon was hosted by Carolyn Shirliff, who has played a key role as an environmental educator with the girls in Salisbury School for many years. Salisbury School has a fantastic garden thanks to her work with the students and a wonderful caretaker.

Participants were treated to an inspirational demonstration of how the food and flowers grown in the schools gardens are used in the kitchens at Salisbury – from Rosemary flowers in the scones to the use of flowers and herbs in winter salads and a spectacular dessert!

We made our own seed mats and seed pots, learnt about soil composition and checked out the large tunnel house, vegetable and herb gardens as well as the native bush area. The girls at Salisbury had kindly potted up some seedlings for us to take away, and Adie provided lots of NZ Curriculum connected learning activities suitable for all levels.

If you would like copies of any of the resources Adie provided, or to register for the term 4 TOTSEE workshop on Biodiversity, 15th Nov 1.30–3.30 at Whenua Iiti Outdoors, please contact

Adie.Leng@tasman.govt.nz

Shifting the Power: Saturday October 27 Nelson Public Presentation

On Saturday October 27, Brittany Packer, a young environmentalist, in conjunction with the team at the Nelson Environment Centre, is hosting a day of workshops, food and fun, with a focus on climate change.

Join her at 1 Braemar Place from 10:30am till 3:30pm, on Saturday October 27. Everyone welcome! All ages, experiences, and backgrounds!

This will be a regional event in prelude to a national youth climate summit. Preparations are underway for a mass of young people to converge in Auckland in early December to shape their future, in the first-ever national event known as Power Shift NZ–Pacific 2012. There are 2 prize tickets to Power Shift NZ–Pacific 2012 to be drawn from a hat on the day! Come along and be in to win!

Free Biodiversity Professional Development Workshop term 4 - TOTSEE

The next proposed professional development programme for teachers is on 15th of November here at Whenua Iti Outdoors from 1:30 – 3:30pm.

The focus will be on Biodiversity. Adie will provide an overview of the fantastic new text 'Go Wild' by Maggie Atkinson and Michael North, Whenua Iti staff will introduce teachers to their restoration project and provide some on-site environmental based games that students will experience when they come on school visits, and we will learn about some of the other restoration projects underway around the region.

The previous three workshops we have run have been well attended and participants have found them very valuable so contact Jo, Adie, Claire or Lindsey now to register your interest!

Or contact Catharine Wood Development and Communications Manager
WHENUA ITI OUTDOORS

P: 03-526 7842 E: catharine@whenuaiti.org.nz www.whenuaiti.org.nz

Top of the South Environmental Educators - teacher professional development for 2013

We need ideas for next year's once a term workshops please. When you know which environmental themes you are planning for 2013 and would appreciate some professional development for staff, please let us know so we can organise collaborative agency workshops that are relevant to you.

Green Drinks – Nov 14 & Dec 12

This is an opportunity to network with friendly people, who have a diverse range of interests in caring for our planet. Held every second Wednesday of the month, starting at 5:30pm at the Vic, on Trafalgar Street near the Cathedral, Nelson – Just say you are there for 'Green Drinks' and you will be made welcome.

Nelson Growables Garden Fair

Sunday, 18 November from 10am–5pm

Venue: Founders Heritage Park, Nelson

Contact: Jo Reilly on 03 5433 663 or info@nelsongrowables.co.nz
www.nelsongrowables.co.nz



Cost: \$5 for adults, kids free. Schools interested in a gardening-related fundraising stand qualify for a free stand.

Regional Enviroschools



Congratulations to Pinegrove Kindergarten

The reflection team matched a huge range of processes and actions at Pinegrove to all of the Guiding Principles (Empowered Students, Sustainable Communities, Respect for Diversity, Maori Perspectives and Learning for Sustainability) in a whole centre approach. – Silver Enviroschool Early Years – Yay!!

Term 4

- Early Years next cluster meeting is an end of year celebration and plan for how to work 2013 together.
- Reflection for Best Practice: Your facilitator will contact you to make a staff meeting time to reflect on your Enviroschools journey – the reflection activities can also be done with students and help to celebrate what you have done and identify next steps. The process assists with prioritising and teaching practice.
- Planning for next year – contact your facilitator to get help with planning themes around the environment. They have a big picture and connections that can help get you started.

Enviroschools National

Check out what is happening around the country's enviroschools:

<http://www.enviroschools.org.nz/>

Calendar

| | |
|--------|--|
| 11 Nov | Big Beach Clean Up 10 – 3pm contact DOC : http://www.doc.govt.nz/getting-involved/events-and-awards/regional-events/nelson-tasman/big-beach-clean-up/ |
| 14 Nov | Green Drinks –network with friendly people, who care for our planet. 5:30pm at the Vic, Trafalgar Street |
| 15 Nov | Free Biodiversity workshop – TOTSEE members Whenua Iti Outdoors from 1:30 – 3:30pm |
| 18 Nov | Nelson Growable Garden Fair from 10am–5pm Venue: Founders Heritage Park, Nelson Cost: \$5 for adults, kids free |
| 21 Nov | World Fisheries day - https://www.facebook.com/pages/World-Fisheries-Day-November-21/141778879204555 |
| 22 Nov | Support and Share – Green Cuppa at Riverside Cafe 3:30 – 5pm |
| 24 Nov | International Buy Nothing Day – www.buynothingday.co.uk |
| Dec 11 | International Mountain Day – www.fao.org/mnts/en |
| Dec 12 | Green Drinks –network with friendly people, who care for our planet. 5:30pm –Vic, Trafalgar St |
| 2013 | Have a safe happy holiday and we will see you 2013 |

Regional Enviroschools teacher hui at Lake Rotoiti



Ehara taku toa

I te toa takitahi

Engari, he toa

Takitini



Success is not the work of one, but the work of many

You may know that the Enviroschools guiding principles are Sustainable Communities, Empowered Students, Learning for Sustainability, Respect for diversity of people and cultures and Maori perspectives. As Enviroschools regional coordinators and facilitators one of our primary goals is to empower the teachers and students we work with, and therefore building capacity within our schools is one of our primary aims. With this in mind the Top of the South Enviroschools team of Adie Leng (Tasman), Claire Webster (Golden Bay), Jo Martin (Nelson), Lindsey Fish (Nelson), Annie McDonald (Marlborough) and Andrea Askin-Mills (Picton) recently ran a 2-day teacher professional development hui at beautiful Lake Rotoiti.

The aims of the hui were to highlight the power of collaboration, facilitate networking amongst like-minded teachers, reinforce and develop teachers' knowledge of the Enviroschools Kaupapa, share some learning for sustainability activities and resources that teachers can use in class, and most importantly treat some hard-working teachers to a fun and inspiring experience with some great kai!

The hui was funded by the Enviroschools Foundation, Mother Earth sponsorship, Tasman District Council, Nelson City Council, and Marlborough District Council. We would like to extend special thanks to Heidi Mardon and Jan Cox from The Enviroschools Foundation and Tasman Mayor Richard Kempthorne for joining us at the hui, and to Giles Panting and Lake Rotoiti School for welcoming us and giving us a tour of their school. Enormous thanks also to the Kea Chicks for their spectacular catering! We would also like to acknowledge Petr Carter from DOC St Arnaud, Leona Plaiser from Tui Nature Reserve, and Daniel Goldthorpe from Marlborough Boys College for their informative and frankly inspirational presentations.

We had some excellent feedback which suggests we achieved many of our aims and we have had requests to run another one next year so watch this space ☺



Tasman School Students are Kaitiaki for Local Estuary



Tiare and Maddi

Tasman School senior students have been monitoring the environmental impact of their school's annual Muddy Buddy Adventure Fun Run fundraising event on their local estuary, the Moutere Inlet. In term one the senior students participated in the "Experiencing Marine Reserves" EMR programme. They learnt about marine biodiversity and the importance of marine conservation while experiencing the marine environment first hand. Snorkelling at Little Kaiteriteri and then in the Tonga Island Marine Reserve was a valuable way to compare the marine life at each, and a significant highlight.

In May the students also learnt that some Inanga eggs were found at Fields Stream which flows into the Moutere Inlet. To encourage more Inanga to spawn they created a temporary artificial spawning site by positioning hay bales on the edge of the stream. The last part of the EMR programme has seen the students take positive action for their local marine environment by observing and measuring the impact the Muddy Buddy Adventure Fun Run has had on the estuary environment close to their school.

"This is part of a longer term involvement the school has in taking responsibility for its environment as an Enviroschool", says principal Pip Wells. "While the new highway was being constructed children helped move local eels to safety. When the school had two letters raising concerns about the impact of our 'Muddy Buddy Adventure Fun Run', their annual family fundraising event, on the estuary, the students were keen to find out more."

Just before the estuary run in March, students surveyed two areas by counting crab holes and snails in 6 quadrants along a 6 metre transect. One transect was in the Muddy Buddy course and one was outside it.

The day after Muddy Buddy's the students were back out, being environmental scientists –making observations, taking photos, counting crab holes and snails and getting muddy again. They have repeated this process once a month for six months and are now ready to collate, graph and analyse their results. They then plan to report their findings and make recommendations to a range of organizations interested in the outcomes – such as the Tasman District Council,

the Department of Conservation and Tasman School's fundraising committee.

'It has been great to work with Megan", said the senior students.

"We get to do some great fun stuff and make a difference as well." From their teachers point of view it is a wonderful opportunity to bring the curriculum alive in a way that is rich and meaningful. The EMR programme has been invaluable in providing the depth and expertise needed to support great learning in a great school."

To find out more about EMR check out the website

www.emr.org.nz



*Lillian and
Jordan*

Raising the curtain!

Hira Kindergarten have created a real treasure for their kindergarten, and solved an expensive problem all in one fell swoop! Rather than buying curtains to insulate their large roof storage area (which could have cost up to \$2000), the resourceful staff bought wool blankets from the op shop, and used a local natural dyeing expert to work with staff and children to create stunning designs from natural dyes with environmental care. The result is rather wonderful, and everyone learned so much from the process. The total cost of this unique curtain made of 10 curtains, with lavish dollops of love, knowledge and skills, was \$800!



Wild Colourful Broadgreen Bugs Sneak Out

Jeana Packer's wildly creative art students at Broadgreen Intermediate have been transforming bicycle helmets, dusters, salad servers and other recycled materials into bright funky bugs.

There's a Cyclops, a Christmas bug, a green bug with a slime trail, a yellow bug with black eyes, salad server bugs, dusters with googly eyes, water gun insects with wild tinsel eyes and a skateboard has transformed into a very funky cowboy hat wearing, fierce feeler wielding caterpillar.

What the kids seem to love most is the freedom to do whatever they want creatively and they love to work in groups, said Nickola Blunt WASA! @ director. If your creativity is bugging you – check out the great materials at the Nelson Resource Centre.



Broadgreen Intermediate students' creations. Front cover photo too.

The School Camp - by Richard de Hamel, LEOTC Educator for Marine Studies.

The notices went home, the permission slips sent,
the kids are excited, we need only one tent!
It's the day of the camp, the cars file in.
Packs and the pillows, bikes and the din.
The motherly mums, the practical dads.
The nervous young sons, the girls and their fads.
Safety belts are buckled and off we all go,
a meandering line - going too slow!
At last we arrive and camp can begin,
the first lost items, the first tail-spin.

So every one knows they're assigned to a group, all, except Saffron, who's helping with soup.
Lunch goes well, with no one scalded or sick, just one small scrap between Damon and Mick.
Damon's now in group three, Mick's in with the 4's. Why did I end up in with Mr Bronson? He snores!
Time for the beach, the sand and the shells, a swim is too grim, and your dead crab sure smells.

"Put it back in the pool", I suggest to little Maggie.
But alas, she's not listening, it gone in her baggie!
The wind has got up and the kids are all shaking,
we head back to the warm, a drink and home baking.
Mr Bronson is a whiz when it comes to a fire.
He's building a wood pile as big as a pyre.
So for tea there's a sausage with cheese, that's grated,
each child, with a stick - the sausages are cremated.
The 'camp diaries' idea, is good but it drags,
and soon it is time to sort sleeping bags.

The pyjamas, the cuddlies, the milo in mugs. I'm really beginning to wish for ear plugs!
It's two o'clock, no sleep, (yawn) what dedication. Blimey, I've forgotten Betsy Brown's medication!
Dawn is bright and clear and sunny. Betsy's alive, and dreamed she was a bunny!
Breakfast is happening, I'm sleep deprived. What's that? Already? Mr de Hamel's arrived?
Oh that's good, I can watch and learn too, he has games and fun stuff for the kids to do.
The kids are got ready, behatted and geared, and before they escape, sun block is smeared!
One game we pretend to be crabs, then fish in the sea, the children have fun, but are learning, I see.
As the tide drops, we form into buddies it's like watching 'Discovery' with Marine Studies!

We spot limpets, seasquirts, and snails too,
but the boys find crabs to make a zoo!
We all look after our friends, and watch the rock pool,
to look after these creatures is our new rule.
After pizza for tea, followed by jello,
The kids are all happy and chatty and mellow
Betsy's pills have gone where they oughter,
washed down with the help of small glass of water
After our concert and having had our last song,
soon we are wondering, who made the bad pong?!

No one owns up, it's just getting worse, and then we remember Maggie's small purse.
We open it cautiously, the smell really stabs, it's the one you get from very dead crabs!
The kids all agree there's oceans to learn, we decide we'll make 'the Sea' our topic next term!
We could get Richard back to learn more about fish, that way we'll learn science that's fun and quite swish.
Richard's service comes from Otago Universitee, it's funded by the Ministry, so mostly it's free!!
So the class unanimously passed a motion,
we need to dial 021 4 OCEAN!



WES Planning for 2013

I can't believe it's already term 4! It's been a full-on year for schools in terms of minimising waste, with several schools working flat out to become zero-waste. With over 50 school visits made, the Hyperwaste Art Expo held, the ARTBox art exchange growing and the plastic bottle greenhouse full of seedlings, our focus now is on planning our WES programme for next year.

Seeking ideas for 2013

Please send me your requests for teacher workshops, student learning, resources, behaviour change programmes and events. I will then use your ideas to design WES schools programme for 2013. These questions might start you off:

- Which next steps are you keen to take in your journey towards zerowaste?
- Would you like to make your school/ECE fundraising event zerowaste?
- Are you keen to create a school/centre-wide policy to reduce waste?
- What combined school/ECE event would you like to see happen, e.g. another hyperwaste art expo, a buy-sell-swap/ethical packaging/zerowaste/Fairtrade event, an expo "all about waste" or a climate change expo?
- Would you like to attend teacher workshops, e.g. in making useful things from waste?
- What new resources would help you teach your students to avoid and reduce waste?
- Any other ideas? How about this one— http://www.huffingtonpost.com/2012/09/20/billa-peeled-bananas-plastic-wrap_n_1900267.html— great for zerowaste lunches eh?

Also, if you would like some help with planning for next year, please contact me.

Waste Education Services and Small Planet are free programmes (funded by Nelson City Council) run through Nelson Environment Centre. The WES/Small Planet facilitator is available to work with all Nelson schools and ECEs.

**Sarah Langi - Waste Education Services
Schools and Small Planet facilitator
Nelson Environment Centre
sarahlangi@nec.org.nz**



Energy in Schools programme

The three primary schools on the pilot Energy in Schools programme are gearing up for a term of fun and excitement, while learning heaps about energy and saving energy costs. Victory, Hampden Street and Auckland Point primary schools have committed to be the first schools in Nelson on the programme. Once the pilot is completed (in March 2013), we hope to secure funding to roll out the programme to interested primary and secondary schools across the region. For more information, and to register interest in joining the 2013 programme, visit the Nelson Environment Centre website: www.nec.org.nz/schools or contact Sarah Langi.

Meet the Energy in schools team:



Aaryn Barlow, Technical and Behaviour Change Officer
Email: aarynbarlow@nec.org.nz

Lindsey Fish, Nelson City Council's Enviroschools Facilitator
Email: lindseyfish@nec.org.nz



Sarah Langi, Programme Coordinator
Email: sarahlangi@nec.org.nz

Whitebaiting – A kiwi tradition

Many of us have spent days at the mouth of a river, participating in this cherished pastime, hoping to catch the tiny fish in the annual whitebait run. Whitebaiters' pursuit of these aquatic natives is more meaningful than tasting the fritter at the end of the day, it is as much about our connection with nature and whanau – our whakapapa. Regardless of catch-quantity, keen whitebaiters return, net in hand, day after day, perhaps because the activity allows time for peaceful reflection that's good for the soul.

What are whitebait?

Whitebait grow to 45-5 cms long and are the juvenile forms of five types of native NZ fish known as galaxids, these are –

- Inanga – make up approximately 70% of the catch
- Kokopu – 3 types – giant, banded and shortjaw
- Koaro – strong climber preferring forested upland streams

Whitebait are in decline

Due to increased pressure on freshwater systems and habitats, amounts of whitebait have decreased. Impacts include–

- Population increase – more people using water
- Agriculture and industry requirements, effluent & fertilizer run-off
- Climate change – droughts and floods
- Habitat destruction, (spawning sites)

How do these issues impact our region?

- Freshwater quality test results in Nelson & Tasman have shown deterioration
- Water-borne disease is a problem in some areas where e-coli (faecal) bacteria threaten community health
- As our urban streams degrade, we lose recreational opportunity and enjoyment
- Vegetation removal around stream-banks (raised temperatures impact cold-blooded water critters)

What can we do?!

UNDERSTAND – by getting in to the stream environment and learning what exists there

VALUE – pristine treasured places are lost when proper consideration isn't given to the ecology and care of the site

MANAGE – to prevent further loss and enhance existing values through educating, monitoring and appropriate action.



Inanga eating moth – Stephen Moore

Waimaori

The Waimaori programme brings reminders that we must value and cherish all the living things in our environment for our own wellness and future prosperity. If our environment is sick, we will suffer the effects. Children have an exciting experience through streamcare activities, resulting in an increased desire to be responsible about looking after their stream.

Waimaori – freshwater programme covers

- ✓ Scientific investigation, analysis and data gathering
- ✓ Step by step hands-on workshops in the water
- ✓ Stream life, life cycles e.g. eels, native fish, bugs
- ✓ Simple directions on how we can all help improve water quality
- ✓ Kaitiakitanga or stewardship to promote becoming guardians of your waterway



Brook Waimarama Sanctuary Field trip days with Waimaori – Freshwater Programme

Many school groups have already taken part in a fun day up at the Brook Sanctuary doing a combination of activities along with their stream investigation that cater to your learning requirements, while reinforcing that everything is connected. The activities include

- ✓ Plant identification
- ✓ Artistic observation
- ✓ Film viewing in Sanctuary building
- ✓ Sanctuary tour and info
- ✓ Stream study in ideal environment

This is a free programme. Waimaori links to a range of curriculum subjects including social sciences, science, community health and well-being. This programme encourages students to carry out their own investigation, problem solve and take action.

Workshops are for a minimum of one-hour, or maximum half day.

We encourage several visits to the stream over time – the aim being for schools to adopt their local waterway.



IF YOU WOULD LIKE TO LEARN MORE – Contact Mel McColgan – WAIMAORI STREAMCARE - waimaori@ncc.govt.nz

The Unpackit Awards

The results of the best and worst packaging, as voted by public, are out. Individually wrapped prunes or vegetables on polystyrene trays?! We thought you might be interested to visit www.unpackit.org.nz/ for the rest of the results.

The Measuring Change

website for waste audits has undergone improvements to make it much easier to record and retrieve the data. <http://www.measuringchange.org.nz/>. Contact your Enviroschools facilitator for support.

Butterfly Gardening Course, certification and Newsletter for Spring 2012

<http://www.monarch.org.nz/monarch/members/members-newsletters/2012-13-magazines/spring-2012/>

There is a feature on the excellent work being done at Omokoroa Point School. We would like to feature more schools – so if you know of a school that is developing a butterfly garden or habitat we'd love to know please.

We are also accepting applications now for Certification – if someone has developed butterfly habitat over a period of time, which is host to at least three NZ species, they will be able to apply for being certified as a good example of butterfly habitat and receive a one-year subscription to our organisation plus a plaque to display. <http://www.monarch.org.nz/monarch/projects/certified-butterfly-gardenhabitats/>

Want to make sure NZ's native butterflies are catered for in your garden? Why not join up on the next Butterfly Habitat course? Five presentations on creating a butterfly garden/habitat are on line over a period of a month. The cost is NZ \$25 for financial members or NZ \$35 for non-members.

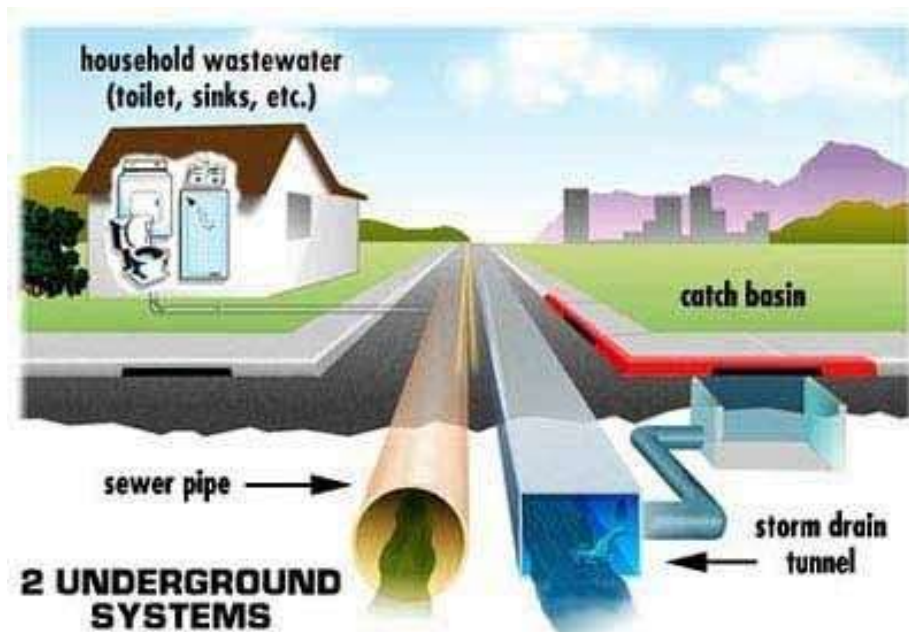
Please contact me Jacqui Knight jacqui@monarch.org.nz. Secretary Monarch Butterfly New Zealand Trust.

Planning the Car Wash Fundraiser?

The Car wash is a great way to fundraise but Councils often receive complaints about the soapy results entering a nearby waterway.

We need to think about the difference between waste water and storm water.

Inside the house, drains pipe water away as waste but drains outside the house pipe away storm water. Urban waste water is treated; however, storm water is not treated and goes straight to the nearest waterways.



Soil is permeable and supports the natural water cycle process. Our human habitat surfaces are mostly impermeable: roads, roofs and concrete all obstruct this process. However, it can be so easy for us, and the rain, to wash away polluting products that collect on these surfaces and forget to where they are going. Prevention is best. Painting, cleaning, sanding, earthworks, concreting, oil, car washing, fuel or oil leaks, doggy doo, litter, garden and food waste, garden sprays and pool or spa products all contain 'stuff' that is toxic and should not be able to be washed down a drain when it rains.



If your class is planning to do a car wash, check that the spot is away from a gutter or storm water drain. Car washing is best done on the grass, or where you can sweep soapy water onto grass. Councils also have a record of the few businesses that have stormwater traps to filter 'stuff.' Don't be put off just take care.

Activity one:

What's happening in our Compost Heap?

Level Beginner to Advanced <http://soil.gsfc.nasa.gov>

Key Concepts

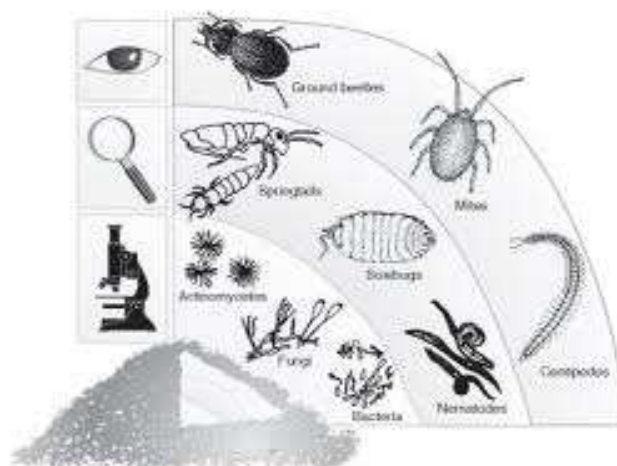
- Microorganisms live in soil and decompose organic matter and detritus in various ways.
- They release nutrients from organic matter during decomposition, some dissolve minerals to release nutrients, while other microorganisms bring subsurface soil, and nutrients, to the surface for plants to use.
- Some microorganisms form a symbiotic relationship with plants to get their carbs and they help plants get nutrients from organic matter.
- Some protect plants from antagonistic pathogens
- Some microorganisms can break down toxins and pesticides in soil, which prevents toxins and pesticides from entering into the groundwater
- Without microorganisms, the surface of earth would be piled high with dead organic matter

Skills

- Identifying the different types of microorganisms and where microorganisms live in the natural environment
- Understanding that their ability to break down dead organic matter, minerals, and toxins result in the release of nutrients and the improvement of soil and water quality
- Understanding competition exists between microorganisms and as a result some form symbiotic relationships with plants to get sugars, while providing a source of nutrients for plant roots.
- Applying this knowledge to what occurs in the natural environment (e.g. fallen leaves pile up, but over time they become wet from rainfall, become compacted, and available for microorganisms to decompose.
- Acknowledging the importance of microorganisms in the environment and what would happen to Earth's surface and plant vitality without them.

Materials and Tools: 2 Handfuls of grass clippings

- 1 cup of potting soil
- 2 zip-closing plastic bags
- A sharp pencil &
- A teaspoon



Class Activities

Activity one continued

Background :

The existence of soil is a primary component in the decomposition of dead organic matter. Soil needs to be at a minimum temperature and moisture level for active decomposition to occur. Air must be available for microorganisms to respire and decompose the dead organic matter. Over time, dead organic matter is reduced in size and volume, continually keeping Earth's surface clear of dead debris.

Composting is the process through which microbes in soil transform dead organic material, such as dead plants and animals, into humus. Humus is an important source of soil nutrients. Gardeners make compost piles by placing layers of kitchen scraps and dead plants in between layers of garden soil. The soil provides a place for soil microbes to live and to decompose dead organic matter. Earthworms contribute by helping to digest the dead organic matter and excreting it as casts, which are also rich in nutrients.



Preparation:

Conduct a discussion about what might be happening in the compost that we can't see. Discuss microbes, their composition, what they do, and where they are found in the natural environment. Discuss the decomposition of dead organic matter, toxins and pesticides. Discuss their relationship with plants, the importance of microorganisms, and what would occur if they were not present in the food chain.

What to Do and How to Do It:

1. Place one handful of freshly mown grass clippings in each of two sealable plastic bags.
2. In one bag, add a cup of fresh potting soil and mix well. In the other, leave the clippings as they are. Seal both bags.
3. With a pencil, carefully poke 5-10 air holes in each side of each plastic bag. Be careful not to poke yourself.
4. Place the bags in a dark place. Once each week, open the bags and add a teaspoon of water.
5. Each week open the bags and look inside. Look closely at the grass. Aside from being dirty in the soil bag, does the grass in either bag look like it has changed from when you placed it in the bag initially? Write down your observations. Compare what you see. Close the bags and put them back into a dark place.
6. Continue to observe the bags for the next few weeks. Write down your observations and explain what you think is happening to the grass, and what is going on in the soil.

Class investigation:

What has happened to the grass that was initially placed in the soil? What happened to the grass without soil? Over time, what is occurring to the grass in the soil? What is occurring to grass that has no soil? What factors do air, water, and temperature play in the decomposition process? If the air, water, and temperature levels are low what do you think will happen or won't happen to the grass, soil, and microorganisms living in the soil?

Activity two: Frozen, Canned or Fresh?

Objective: Students will design an experiment to compare the flavours and textures of a vegetable, interpreting their findings with charts and graphs.

Materials: per group

- 1 frozen package of the vegetable
- 1 can of the vegetable
- 1 bunch of the vegetable fresh
- 3 medium-sized pots
- Hot plate/stove, • Water, • Forks, • Plates, • Napkins



Instructions:

1. Show students a package of the frozen vegetable, a can of the vegetable, and a bunch of it fresh. Discuss the nutritional value of the vegetable. Explain that each group will design an experiment that will examine the visual appearance, taste, texture and smell of all four types of the vegetable (frozen, tinned, cooked from fresh and raw).
2. Brainstorm with the class possible methods of observing and recording the different features of the vegetable. Set clear objectives for the experiments, such as experimental design, time restraints and data organization. Allow students time to develop their plan.
3. Have students present their plan to you (and/or the class) for approval. Provide feedback for each group and allow students to revise their plan.
4. Students shall wash their hands, and conduct their sensory experiments and record observations. Some may need help with cooking their vegetable so parent helpers may be useful.
5. Ask students what conclusions they can make based on the information they gathered. Discuss with the class different ways to present the information. Students create graphs and charts to represent their findings.
6. Have groups present their findings to the class. Ask students to explain which type of the vegetable they liked best and why.

Vocabulary:

Encourage students to use these words when making observations.

Aftertaste: the persistence of a sensation of flavours when food is no longer present.

Mouthfeel: food's physical and chemical interaction in the mouth, used often in the testing and evaluating of foodstuffs.

Pungent: having a strong odour that stings the nose, especially in acidic or spicy substances.

Vibrant: of bright colour.



Activity three: Recycle an Art Animal

The central circle of life is the Earth's cycling of Life Materials. These materials are limited to what is here and have been shared and recycled by all lives since the Earth began. This activity explores death as part of Earth's original re-cycling plan. Students will colour and cut-out a simple animal puppet, create a story about how it lives and finally dies, tear it into small pieces (decompose it), and use the pieces to create a new animal. Students will explore how death is part of a natural cycle, and that they themselves benefit from and participate in this sharing of life materials.

Discussion:

Ask students what would happen if nothing ever died or decayed? Pretty soon, living things would run out of food, shelter, water, air and room-- the stuff we are made of, what we need to survive. These are called Life Materials and in their most basic form are elements such as Oxygen, Carbon, Calcium, and Hydrogen.

The Earth is pretty much a closed system. Except for meteorites, the total amount of Life Materials is limited to what is here. These same materials are shared by all lives and have been used over and over again. Have students look at the fingernail on their little fingers. An atom in that finger was once part of a dinosaur! Every atom of our bodies has been part of many other bodies before. Our bodies are entirely made of recycled materials, 100% post consumer content. Caution: As appropriate, clarify that this applies only to the physical body, not to spirit or soul. Think of some ways we, all cycle life materials through our bodies: we drink water from the river, eat vegetables from the garden and then go to the toilet. We breathe oxygen in and carbon dioxide out. Our bodies are made entirely of what we eat and breathe.

Death is Earth's original re-cycling plan. It is the way that shared life materials become available to new lives. A tree dies and rots back into soil for new trees to grow. A seal dies and is food for gulls, bacteria, and beetles.

Decomposition is what happens to all bodies, plant and animal, after death. Decompose means to break down into basic elements, to return the Life Materials in that body to their simple re-usable form.

Teacher: Parts of this discussion may be best done after the activity, when the basic concepts have already been inferred by many students.

1) Make an animal puppet.

Each student should chose an animal from the local habitat or a habitat the class is studying. Remind students that birds, insects, frogs and fish are animals, too, not just mammals. On construction paper, students draw the animal's outline to fill the paper and then paint or colour it. Cut it out and tape a stick or dowel on the back to turn it into a simple puppet. Save the scraps; you'll use them later.

2) Let the animal come to life

In trios or pairs, have students do simple play/puppetry/storytelling with their animal-puppets. Focus on everyday natural doings about its life. As appropriate to your goals have students research their animal, its activities and behaviour.

3) Enact the animal's death

Remind students that most animals that die in nature are not killed by predators. Discuss how their puppet animals might die in ordinary ways--from disease or injury, old age or predation. Most animals just get old, and succumb to diseases of aging.

Suggest to students that they imagine and enact a non-violent death, but leave the decisions up to them. Students then decide how their animal dies, enact/tell that story, and tear or cut puppet into little pieces to represent its death and decomposition. **All pieces must be saved (see next section).**

Decomposition happens to all bodies after death, plant or animal. *Decompose* means to take apart into basic elements or components.



Class Activities

Activity three continued

Decomposition returns a body's Life-Materials to their simple state again, so other lives can re-use them. Some students may like the option of saying a few words over the animal's body in farewell.

4) Prepare to Circulate the Life Materials

Discuss how the life materials from their animal might change and be circulated throughout the environment-- eaten and digested by animals, or decay into soil, taken up by plant roots, or moving through the air as gases or moving through water as a liquid.

Place three containers at a classroom station labelled SOIL, AIR, and WATER. Students distribute the Life Materials (pieces) of their animals among the three containers. Cut up scrap paper from the animals' making to ensure plenty of Life-Materials for the next stage.

5) Create a new mosaic animal

Each student draws an outline for a new animal. Students collect little pieces (Life Materials) from the Soil, Air, & Water containers and glue them within the outline to create a mosaic animal. (Second drawing may be smaller to ensure plenty of Life Materials for mosaic.)



6) Process What Was Learned

It's now a good idea to return to the original discussion about death that began the activity. Find ways to assess what has been learned. Caution: A few younger students resist having their original animal puppet die. The resistance may be connected to prior experience and must be treated respectfully. We have had success by allowing a few puppets to live on, and using the paper scraps from their making as the Life Materials placed in the three containers. Stress early on that all scraps from the first puppet making must be saved.

Note: Younger students, such as those pictured above, don't like to cut up their animals' heads. Some just don't do it. It works out fine. It's great fun to later discover their turtle's head in the leg of a mosaic elephant. And that's part of the lesson.

Bear in mind throughout this activity that to people, talking about death is taboo except when unavoidable. However, many kids who have completed this lesson feel liberated by the understood connection between death and the re-cycling of Life Materials.

Do not hesitate to use this activity with people of any age. Older kids, and adults, love the freedom to play like little kids, and strongly appreciate this ecological perception of death and cycling.

Alternative Ending

Paper-Making: Do Steps 1 through 4, then, Instead of making a mosaic, soak the torn pieces of paper in water, mix in a blender and lay on a screen to make multi-coloured paper. Students draw their new animal on the recycled paper, cut it out, and mount it on construction paper for display. This method of suggesting decomposition is highly effective.

Conceived by Kay Grindland