



## Capacity Building vital for expansion

The Conservation Education program continues to expand and is embarking on new avenues to pass on conservation messages, like offering a diploma course through University of Goroka. To complement its expansion, the program has set staff training as a priority in the hope of upgrading program officers' knowledge and skills to take on new roles and challenges.

In 2006, two staff went for further training. Senior Teacher trainer Sangion Tiu underwent a one-year Master of Science degree at the University of Waikato in New Zealand under the New Zealand Aid Scholarship scheme. Ms Tiu's thesis titled *"The Role of Indigenous Knowledge in Biodiversity Conservation: Implications for Conservation Education in Papua New Guinea"* focused on the importance of indigenous environmental knowledge and how this knowledge can be used to promote biodiversity conservation efforts. The thesis also explored how indigenous environmental knowledge was acquired, interpreted and disseminated and how these ideas could be useful for Conservation Education practices in Papua New Guinea.

Emmie Reresi, the Sat. CERC Coordinator, did a post graduate diploma in education (PGDE) at the University of Goroka for one year whilst attending to some program activities. She has completed the program successfully and graduated at the end of

last year. With these knowledge and skills, she is now able to fully take over all PABLO training which she has been assisting with for the past four years.

A similar arrangement is also in place for Program assistant Julien Pochimel, who is currently studying post vocational training in education (PVTE) in business studies at the University of Goroka. While on full-time study, Julien is also expected to assist with other program activities.

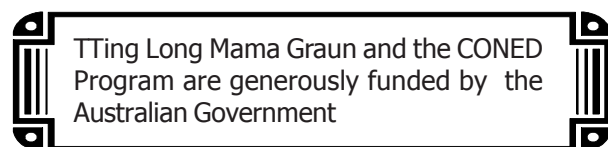


Newly Inducted HELP trainer Kome, receiving his certificate from Mr. Waukave.

Apart from that, regular maintenance of computers, accessories and office network to ensure they function efficiently is important for the program. To ensure this, CERC officer Ambiki Kome recently attended a three week course on implementing & supporting Microsoft Windows XP professional at the Institute of Business Studies (IBS) in Port Moresby. Apart from his main duties, he is also responsible for the general

maintenance and monitoring of the office computers and Network. The training has enhanced his IT skills and placed him in a position to effectively configure, install, troubleshoot and administer Local Area Network (LAN) for the office computers.

On another note, Mr. Kome is also under induction program to take over HELP training in the near future. His induction program began with a two-day theoretical training workshop followed by a week of practical sessions on facilitating workshops. Mr. Kome was presented with a trainers' certificate on the 5<sup>th</sup> of April by the Finance & Administration Manager Mr. Kelvin Waukave. On presenting the certificate on behalf of the program manager during a special morning tea, Mr. Waukave commended Mr. Kome for his efforts on embarking on the new challenge.



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### New Materials at the CERC's

A new year, means more new books. And of course we do have more newly acquired materials which shall soon be on our shelves.

Teachers, take note of these new titles, they could become useful anytime during your teaching.

- The Earth Policy Reader, by Lester R Brown
- Introduction to Plant Ecology – A guide for beginners in the study of plant communities, by A.G. Tansley
- Understanding the Environment – Bridging the disciplinary divides, edited by R. Quentin Grafton, Libby Robin and Robert J. Wasson
- Tree Kangaroos of Australia and New Guinea by Roger Martin
- Echidna – Extraordinary egg-laying mammal, by Michael Augee, Bret Gooden and Anne Musser
- African Rain Forest Ecology & Conservation edited by William Weber, Lee J. White, Amy Vedder and Lisa Naughton-Treves
- The Biology of Mangrove by Peter J. Hogarth
- Green Imperialism – Colonial Expansion, Tropical Island Edens and the Origins of Environmentalism, 1600 – 1860 by Richard H. Grove
- Tropical Forest Remnants- Ecology, Management, and Conservation of Fragmented Communities by William F. Laurance & Richard O. Bierregaard, Jr

## Notice Board

Welcome back teachers to a new year 2007. We hope this year will be a good year for us all as we continue to work together in partnership.

We also welcome back Senior Teacher Trainer Sangion Tiu who returned in early March after completing a one-year Masters through research at the University of Waikato in New Zealand. World Environment Day theme and basic facts have been included to guide you as you prepare for it.

As the New year unfolds we will continue to update you on all program activities.

Do not forget to check out the children's and teachers's corner for interesting activities and ideas to try out. Even the CERC reviews and wildlife section could be of interest to you.

Happy Reading!

### Important dates to take note of for this year.

HELP workshops 2007

- May 7th - 11th New HELP for Simbu
- May 28th - 1st June New HELP for Morobe

Other Activities

- May 1st WHP Sat. CERC Open Day (Invited schools attend)
- May 16th Korefeigu Primary School Outreach
- June 5th World Environment Day Theme-  
**Melting Ice: A hot topic?**
- June 6th Morobe Sat. CERC Open Day (Invited schools attend)
- June 8th Goroka CERC Open Day (Invited schools attend)

## Attention Teachers!

We would like to have your input into this newsletter as well. Please send us a letter or note of any news that might be of interest to us regarding conservation in your school or community. If you have successfully implemented a school conservation project in your area let us know so we can feature it in the newsletter. Not only that, even if you have some concerns, or suggestions by all means the newsletter is an excellent medium of sharing your views and concerns with others.

An alternative would be to drop off any information at the Satellite CERC's in WHP, Simbu, Goroka or Morobe.

Your contribution will be greatly appreciated.

## WORLD ENVIRONMENT DAY- 5 JUNE 2007

### Theme: MELTING ICE: A HOT TOPIC?

*Some important facts on the effects of Climatic Change (Adapted from UNEP)*

The Earth has warmed by approximately 0.75 °C since pre-industrial times. Eleven of the warmest years in the past 125 years occurred since 1990, with 2005 the warmest on record. There is overwhelming consensus that this is due to emissions of greenhouse gases, such as carbon dioxide (CO<sub>2</sub>), from burning fossil fuels.

Examination of ice cores shows that there is more CO<sub>2</sub> in the atmosphere than at any time in the past 600,000 years. Between 1960 and 2002, annual anthropogenic global emissions of CO<sub>2</sub> approximately tripled. They rose by about 33 per cent since 1987 alone.

Warming in this century is projected to be between 1.4 and 5.8 °C. The impacts of climate change are already visible. *Examples include: the shrinking Arctic ice cap; accelerating sea level rise; receding glaciers worldwide; thawing permafrost; earlier break-up of river and lake ice; increasing intensity and duration of tropical storms; lengthening of mid- to high-latitude growing seasons; and shifts in plant and animal ranges and behaviour.*

*In the Arctic, as peat bogs thaw they are releasing methane, an even more potent greenhouse gas than CO<sub>2</sub>. Scientists are increasingly concerned about the possibility of abrupt climate change, including reductions in ocean currents, such as the Gulf Stream which warms Europe, and changed patterns of rainfall, such as the monsoon seasons, which would affect food security for billions of people.*

#### **Ask a polar bear...**

The Arctic is warming twice as fast as the global average. The area of the Arctic Ocean covered by ice each summer has been shrinking, and the remaining ice is becoming less thick. Because more heat is absorbed by the sea than by ice, a feedback is created which results in further melting. Since 1980, between 20 and 30 per cent of sea ice in the European Arctic has been lost.

Polar bears depend on sea ice, where they hunt seals and use ice corridors to move from one area to another. Pregnant females build winter dens in areas with thick snow cover. They have not eaten for five to seven months when they emerge with their cubs in the spring. They need good spring sea-ice conditions for their own and their cubs' survival.

During the past two decades, the condition of adult polar bears in the Hudson Bay area in Canada has declined, with a reduction of between 15 and 26 per cent in average adult body weight and the number of cubs born between 1981 and 1998. Some climate models project that there may be an almost complete loss of summer sea-ice in the Arctic before the end of the century. If this happens, polar bears are unlikely to survive as a species.

#### **Ask a farmer...**

Although crop yields may increase in some areas

due to climate change, the negative effects are likely to dominate as warming increases. Africa is especially vulnerable, and studies warn that there may be a significant increase in hunger.

Poor communities are most directly dependent for their livelihoods on a stable and hospitable climate. They often rely on rain-fed subsistence agriculture, and are deeply dependent on climatic phenomena, such as the Asian monsoons. They are also most vulnerable to extreme weather events such as droughts and tropical storms.

As glaciers melt in the world's great mountain ranges, water supplies to rivers will be affected. In Europe, eight out of nine glaciated regions show significant retreat. Between 1850 and 1980, glaciers in the European Alps lost approximately one-third of their area and one-half of their mass.

In China, highland glaciers are shrinking each year by an amount equivalent to all the water in the Yellow River. The Chinese Academy of Sciences says that 7 per cent of the country's glaciers are vanishing annually. By 2050, as many as 64 per cent of China's glaciers will have disappeared. An estimated 300 million people live in China's arid west and depend on water from glaciers for their survival.

#### **Ask an islander...**

In the past 100 years, global sea level rose between 1 and 2 millimetres a year. Since 1992 the rate has increased to about 3 millimetres a year, primarily through thermal expansion of warming oceans and freshwater flowing into the oceans from melting ice.

Melting ice is responsible for a significant portion of the observed sea level rise, with the Greenland and Antarctic ice sheets the largest contributors. The Greenland Ice Sheet is melting faster than new ice is being formed. In the Antarctic, three large sections of ice shelves in the Antarctic Peninsula have collapsed over the past 11 years, followed by a marked acceleration and thinning of glaciers that were held back by the shelves.

As sea levels rise, inhabitants of low-lying islands and coastal cities face inundation. In December 2005, a small community living in the Pacific island chain of Vanuatu became perhaps the first to be formally moved as a result of climate change. Climate change also threatens marine habitats and the livelihoods of the people who depend on them. The oceans have absorbed approximately half of the CO<sub>2</sub> produced in the past 200 years, producing carbonic acid and lowering the pH of surface seawater. This could affect the process of calcification by which animals such as corals and molluscs make their shells from calcium carbonate.

#### **Ask an indigenous person...**

Arctic communities, including indigenous people striving to maintain and adapt traditional lifestyles, are

*Cont. on page 5*

# Lecture Series #1

## *Global Warming - its impacts on the environment*

*By Sangion Tiu*

Planet Earth's capacities for dispersing, diluting, and degrading most human generated pollutants are large, but limited. As pollution rates increase, the natural processes that absorb and assimilate pollutants are eventually overwhelmed, leading to rising concentrations of pollutants in the environment. Depending on the pollutants, this overloading can create local disruptions in human health and ecosystem sustainability or, eventually, even global effects, such as climate change. Since their mastery of fire, human beings have disrupted the global carbon cycle by burning wood and other biomass (*living mass*) at greater rates than those that occur naturally. Being mostly made of carbon, combustion of biomass releases carbon dioxide, methane, carbon monoxide, and other carbon-containing pollutants, which must be transported and broken down by natural processes. Some of this release has been the direct result of using wood and other biomass forms such as fuel from crops. Another part is due to the clearing of biomass so that the land could be used for farming or other human purposes.

The industrial revolution increased the combustion of fossil fuels, which are mostly carbon. Today, fossil fuel combustion is the major source of atmospheric carbon releases although biomass burning has also probably increased. The rates of release became such that in the second half of the twentieth century, it became clear that atmospheric levels of important carbon-containing gases, particularly carbon dioxide and methane, were steadily increasing over their natural levels.

The atmospheric concentrations of these gases are far from those thought to be toxic or otherwise of much acute concern. Their impact is more subtle, for they act to blanket Earth, keeping in more of the sun's warmth than otherwise would be the case. This effect is indisputable because humans have observed the warming due to natural levels and variations of these same gases. Indeed, without the existence of these natural amounts of greenhouse gases', Earth would be too cold for life.

The higher-than-natural rates of greenhouse gas releases resulting from fossil fuel and biomass combustion are boosting carbon dioxide and methane levels at greater rates than has occurred in the recent history of the Earth. The Earth's natural systems may not be able to cope with the extra heat being absorbed resulting in an overall increase in temperature, that is, *global warming*. This warming may in turn be associated with significant disruptions in local weather, such as patterns of precipitation and cloudiness. It may also have global impacts through thermal expansion of the oceans and melting of glaciers to cause sea-level rise. It may even disrupt ocean current patterns and marine and terrestrial ecosystems.

The nature and magnitude of global warming and associated climate change and sea-level rise resulting from

greenhouse gases released by human activities are not known with certainty. The global atmospheric/ocean/climate systems are extremely complex, so much so that even the largest computers can only model a small portion of them at one time. Thus, contemporary estimates of the global effects are imprecise and so uncertain as to be not usable for predicting effects at any one place and time.

Nevertheless, a growing number of scientists believe that there is a significant chance that damaging levels of global warming will occur sometime before the middle of next century if existing trends of greenhouse gas emissions are continued. The Intergovernmental Panel on Climate Change (IPCC) predicts that unless emissions patterns change, there will be a rate of increase in global mean temperature during the next century of 0.3°C per decade (with an uncertainty range of 0.2-0.5°C per decade); this is greater than that seen over the past 10,000 years. This will result in a likely increase in global mean temperature of about 1°C above the present value by 2025 and 3°C before the end of the next century.

IPCC's collective judgment is that rapid change in climate will change the composition of ecosystems; some species will benefit while others will be unable to migrate or adapt fast enough. The effect of warming on biological processes may increase the atmospheric concentrations of natural greenhouse gasses. This warming could cause major and mostly negative local impacts on agriculture, forestry, water resources, natural ecosystems, air quality, and coastal zones among other sectors important to humanity.

A serious effort must be made to reduce the probability and magnitude of adverse impacts from global warming. According to the IPCC, a successful response strategy is likely to be one which recognizes that climate change is a global issue and that effective responses require a global effort. These responses may have considerable impact on humankind and individual societies. Industrialized countries and developing countries have a common responsibility in dealing with problems arising from climate change.

The challenge facing humanity, therefore, is to find ways that the many benefits accompanying economic development can be attained by the world's poor without simultaneously emitting the amounts of greenhouse gases that have accompanied such economic development in the past; and to reduce dramatically the emissions from rich countries at the same time.

*Source: Community Development Library for Sustainable Development and Basic Human Needs  
2.1 August '02*

## Program activities update

### More students enrol for UOG course

The certificate course has gained the interests of a good number of students from the University of Goroka this year. Since classes commenced a total of sixty one students have registered for the 'Environment and Conservation in Melanesia' course.

The marked increase in intake resulted from students growing interest in the course offered by RCF. Previously, the course was only offered to final year Social Science students. This year, the course has been extended to Science final year students as well. As there are more students, two tutorial sessions are conducted every Thursday. Recently the students made a field trip to Mt. Gahavisuka to observe the nature and state of the provincial park. It gave the students the opportunity to identify the requirements of parks in general and the



Students pose for a group photo at Mt. Gahavisuka park with Mrs Panta in foreground.

task of having to maintain facilities for visitors as well as image of the park.

### Monitoring workshop for staff

The PNG Incentive Fund has funded the program since 2002 during phase one and now in the second phase. As funding period winds down, monitoring and evaluation of program activities will be vital. In February, Terri Chala of PNGIF did a one day workshop for Con.Ed staff on monitoring and evaluation methods.

The purpose of the workshop was to acquaint staff with the methods and importance of monitoring and evaluation of program activities.

The focus of the workshop was to enable staff to identify output indicators which reflect the projected outcome of program activities and provide informative reports.

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particularly vulnerable to environmental change. The Arctic is home to some 4 million people, of whom roughly 10 per cent (400,000) are indigenous. Concentrations vary, from the Inuit, who comprise 85 per cent of the population of the Nunavut territory in Canada, to the Sámi, who account for 2.5 per cent of the population in northern Scandinavia and the Kola Peninsula.

Widespread melting of permafrost in Alaska and Siberia is causing serious damage to buildings, pipelines, roads and other infrastructure. Climate change means shorter ice seasons for traveling on winter roads, and warmer and less predictable weather, causing more forest fires in some regions.

Agriculture in the Arctic is severely limited. Subsistence economic activities are therefore mainly hunting and fishing, reindeer herding, trapping and gathering. Warming throughout the Arctic is a problem for reindeer herders and hunters who travel on frozen rivers and through snow. More melting and freezing of snow also makes food less accessible to caribou and reindeer, affecting the economies and cultural integrity of herders and hunters.

Sea-ice changes and related increased coastal erosion are also causing damage, necessitating the relocation of some coastal communities (such as in Shishmaref, Alaska), and affecting indigenous marine hunters and fishers.

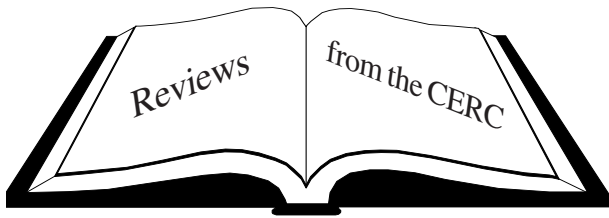
### Ask yourself...

There are many options available to avoid catastrophic climate change. These include worldwide improvements in energy efficiency and a shift to low-carbon and renewable resources such as solar and wind power, bio-energy and geothermal energy. There is also potential for capturing and storing CO<sub>2</sub>, while a number of analysts consider that nuclear power could play a significant role.

A low-greenhouse gas future will also need to include social changes. Millions of households now use the sun to heat water, with an increasing number also harnessing solar energy for electricity. In Iceland, abundant hydropower and geothermal energy is being channelled into developing hydrogen from water as a major energy source to replace fossil fuels. In Brazil, ethanol made from sugar cane has replaced about 40 per cent of the country's need for petrol.

From Vietnam to Australia, Kenya to Mexico, people are banding together to plant trees, many of them as part of the **UNEP Plant For The Planet: Billion Tree Campaign**. Trees can slow climate change by absorbing carbon dioxide as they grow. They also help to reduce pollution, keep cities cool, protect water catchments and reduce soil erosion.

**So teachers we encourage you to be part of the UNEP Plant for the Planet: Billion Tree Campaign.**



***The Biology of Mangroves, Peter J. Hogarth, 1999, Oxford University press.***

This is an extra ordinary book on mangrove from the series of Biology of Habitats. Mangroves are biologically fascinating: The plants and animals that make up these ecosystems have a variety of mechanisms for coping with the harsh conditions of salt, low oxygen in the soil, high temperatures, and periodic flooding. Mangroves are also economically of great importance throughout the tropics as protection against shore erosion and as the basis of local fisheries and other human activities.

This book gives an up-to-date and very readable overview of the biology of mangrove systems around the world. The text is clear and lively, illustrated with relevant anecdotes as well as many photographs and drawings, and supplemented with ample references for further readings. The author also covers the subject of

management of human activities that affect mangroves including sustainable methods of fishing and fish farming. No other book covers all the aspects of the biology of mangroves as this one does, including man's economic interests in these extra ordinary ecosystem.

***Global warming – personal solutions for a healthy planet, Chris Spence, 2005, Palgrave Macmillan***

This book is ideal for those who want to understand climate change but are intimidated by the scientific language that often surrounds the issue. Chris Spence breaks through the jargon with straight-forward answers to questions such as, 'How will I be affected?' and 'What can I do about the problem?' His book is well researched and superbly written – an engaging and entertaining read on an issue everyone should know more about. Perhaps its greatest strength is the writing style – clear, concise, with an engaging flair. It makes for an enjoyable and informative journey into one of the most serious threats to face the planet. This book should be read by policy makers, students, teachers, researchers and the public so that they understand what is happening to our world, and what we as inhabitant must do about it.

## Snails - *Aspersa*

The name snail applies to most members of the molluscan class Gastropoda that have coiled shells. Snails are found in freshwater, marine, and terrestrial environments. Most are of herbivorous nature, though a few land species and many marine species may be omnivores or carnivores.

While most people are familiar with only terrestrial snails, the majority of snails are not terrestrial. Snails with lungs belong to the group Pulmonata, while those with gills form a paraphyletic group.

The amazing fact about all snails is that snails are *bisexual* or are male and female at the same time! Each makes both sperm (male sex cells) and eggs (female sex cells). But they can not fertilize their own eggs, so they still have to find mates. At mating time, two snails first get to know each other by touching tentacles. They press their bodies together to exchange sperm, which will fertilize each other's eggs. After mating, each snail goes off to lay eggs under damp leaves and new lives emerge.

In the wild, snails eat a variety of different foods, including leafy vegetation, fruits, manure and carrion. They can cause damage to agricultural crops

and garden plants, and are therefore often regarded as pests. When kept as pets, snails will eat nearly anything, and snail owners should make sure which diets are appropriate to the species involved.

### *Fact file*

**Kingdom:** Animalia

**Phylum:** Mollusca ( soft-bodied invertebrate)

**Class:** Gastropoda ( sucker-like foot with shell)

**Subclass:** Herterobranchia

**Family:** Stylomatophora

**Genus:** *aspersa*

*Note: This is generally for snails not a particular species.*

**Range:** All terrestrial snails are found in wet and damp places. A group of snails called paraphyletic are aquatic as they possess gills.

Source: Ranger Rick; November 2006, National Wildlife Federation

## CHILDREN'S CORNER

### Conservation at home!



A poster on the long beaked echidna drawn by a grade 6 student of Kuru-Henagaru Primary School. The A4 size poster was used to create awareness.

Grade six students of Kuru-Henagaru Primary School in EHP were challenged by their teacher to educate their families about some PNG endangered animals. As part of their work, students were asked to draw posters of some endangered animals as shown in the picture.

Students then took the posters home and informed their families about the importance of the endangered animals and how to protect them so as to improve their chances of survival.

Now that's a brilliant way of creating awareness at home! So teachers and students let's all work together to pass on the conservation message to show our concern for the environment.

### Snail Trail.....

Students can either work as an individual or in pairs to really understand how snails move. Collect some snails from nearby damp places and try out the following experiments:

**1. Creepy crawler** - put a snail on your hand and watch it closely.

#### Questions

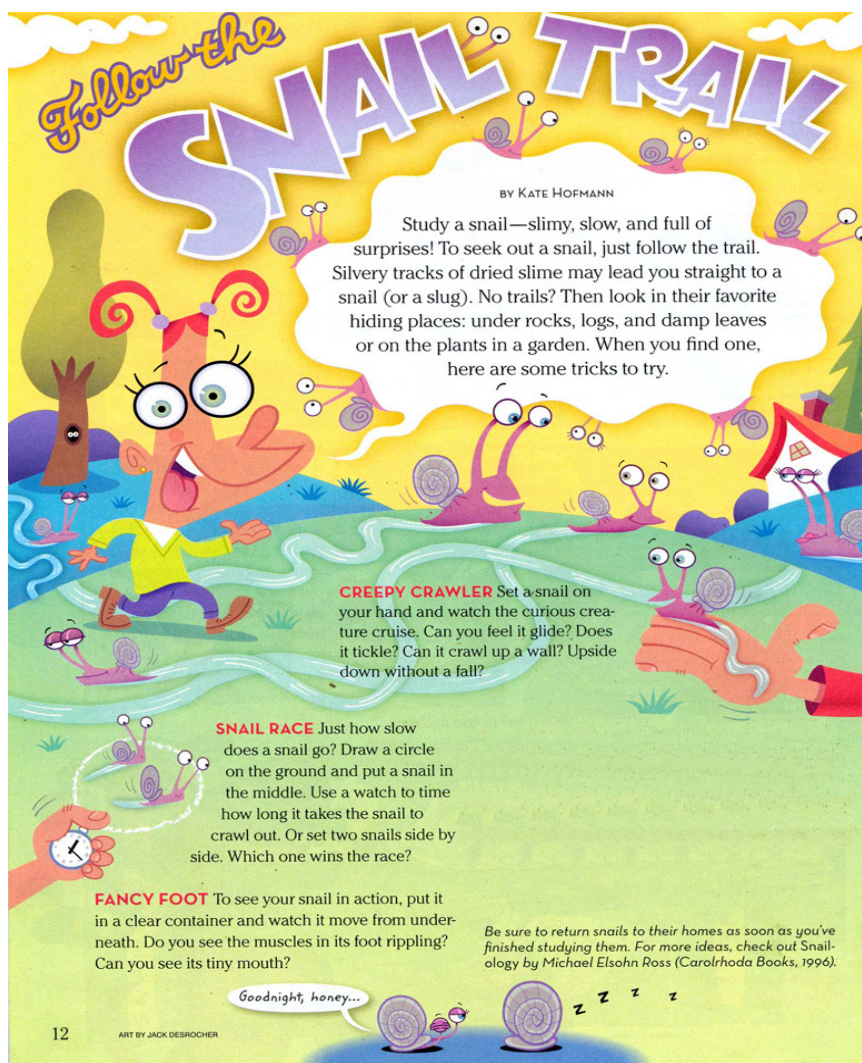
- Can you feel it glide?
- Does it tickle?
- Can it crawl up a wall?
- Can it crawl upside down without falling?

**2. Snail race** - draw a circle on the ground and put a snail in the middle. Use a watch to time how long it takes the snail to crawl out of the circle. Or set two snails side by side. Which one wins the race?

**3. Fancy foot** - put your snail in a clear glass container and watch it move from underneath.

#### Questions

- Do you see the muscles in its foot moving?
- Can you see its tiny mouth?



# Teacher Activity Corner

## Whale Echolocation

This is an exciting science activity for students in grades 3- 5. You can choose to use whale or bats depending on students' prior knowledge of the animal. Choose an animal students are more familiar with, for example bats would be ideal for highlanders.

**Overview:** Most animal use sight and smell to locate their food while others like whale and bats use echolocation to locate their food. Echolocation is a form of communication that makes use of echoes. The animal sends out sounds either very high or very low pitched which the human ear cannot detect. The sound travels out and once it hits an object, the echo travels back to the animal. The animal then judges where the object is, whether it is a hard or soft surface, and whether it is food or not depending on the echo.

This activity will provide students with a concrete experience in using echolocation to track an object or food.

The purpose of this activity is for students to understand how sound and echo can be used to track objects and food in the surrounding environment.

By the end of the activity students will be able to explain echolocation, demonstrate how a whale or bat uses echolocation to track food.

**Resources/Materials:** Strip of cloth and large playing area

### Activity Procedure:

1. Set up perimeter of playing space.
2. One student will become the whale or bat and be blindfolded with the strip of cloth.
3. Other students can move to any place in the boundaries, but they must stay there.
4. The whale then calls "echo" and the other students (the food) respond with "location". The whale/bat tracks the food by following the sound of students responding until it locates one(food). The food then becomes the whale and the game continues until everybody becomes whale.

Variations in the game:

1. Students can vary the volume of response.
2. Students can sit, stand, or lie down.

*Source: Adapted from Rebecca G. Whitworth, Perkins Elementary School, Oklahoma, USA*

## RETURN ADDRESS

Research & Conservation Foundation of PNG  
PO Box 1261  
Goroka, EHP  
Papua New Guinea

Contact us for more information or to organise a visit to the CERC.

PO Box 1261	Ph: (675) 732 3211
<b>Goroka, EHP</b>	Fax: (675) 732 1123
PNG	Email: rcf@rcf.org.pg