Scienza VIVA
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## What is Scienza Viva?

Scienza Viva commenced in 2002. It is a program developed to actively engage K-12 students in syllabus based “hands on” science.

# Environmental hands on activities offered to Primary School

All activities are **one hour long** and taken a class at a time with about 30 students per class. The **cost** is $8 per student attending on the day for a one hour session with a minimum invoice of $240. NB a couple of activities require a minimum of 80 students for the booking.

1. Minibeast (invertebrate) hunt in the soil/compost.

A minibeast “hunt” in compost where students observe features and characteristics of compost invertebrates and think about their needs (Early Stage 1-Stage 1).
Links to Knowledge and Understanding outcomes in the NSW Syllabus:
**Early Stage 1** - STe-3LW-ST. **Stage 1** - ST1-4LW-S.

2. Minibeasts (mostly invertebrates) in soil and water.

A station activity. Includes microscopy, chemistry and observation of live terrestrial and aquatic invertebrates. Students look at features, characteristics and needs of soil and water organisms (Stage 2 - Stage 3).
Links to Knowledge and Understanding outcomes in the NSW Syllabus: **Stage 2** - ST2-4LW-S. **Stage 3** - ST3-4LW-S.

3. Minibeasts (mostly invertebrates) from the beach.- taken class at a time but minimum booking for 80 students

Students will be engaged in a close look at features and characteristics of marine organisms. They will think about what they need to live in this harsh environment.
**Suitable for Early Stage 1 - Stage 3.**
Links to Knowledge and Understanding outcomes in the NSW Syllabus:
**Early Stage 1** - STe-3LW-ST. **Stage 1** - ST1-4LW-S. **Stage 2** - ST2-4LW-S. **Stage 3** - ST3-4LW-S.

4. The Water Cycle.

Students will learn where our freshwater comes from and why it is so precious. After working out how the water cycle works the children make their own mini-water cycle (a terrarium) to take home. The activity finishes with a water cycle game.
**Suitable for Early Stage 1 - Stage 3.**
Links to Knowledge and Understanding outcomes in the NSW Syllabus:
**Early Stage 1** - STe-6ES-S. **Stage 1** - ST1-10ES-S. **Stage 2** - ST2-4LW-S. **Stage 3** - ST3-4LW-S.

5. Adventures in Sustainable Energy.

This station activity allows the students to observe forms of energy creation and transfer, with emphasis on the selection of safe and renewable energy sources. We use a variety of

methods of generating electricity (model solar panel, model wind generator, muscle power, chemical sources (lemon batteries and also real battery chemistry). We also look at direct heat energy, as in solar hot water, and uses of sources of energy like falling water.
**Suitable for Stage 2 - Stage 3.**
Links to Knowledge and Understanding outcomes in the NSW Syllabus: **Stage 2** - ST2-8PW-ST. **Stage 3** - ST3-8PW-ST.

6. Marine Environment and Pollution taken class at a time but minimum booking 80 students
A station based activity examining the survival and adaptations of some marine creatures and the way that properties of the materials that humans select, use and discard affect the marine environment
**Suitable for Stage 3.**
Links to Knowledge and Understanding outcome ST3-4LW-S in the NSW Syllabus.

## Environmental activities offered to High School

All activities are **one hour long** and taken a class at a time with about 30 students per class. The **cost** is $8 per student attending on the day for a one hour session with a minimum invoice of $240. NB two of the activities require a minimum of 80 students for the booking.

1. **Soil and Water- biotic and abiotic features.**

Students rotate around the laboratory through ten station activities. Each station has a hands on activity and students are provided with notes and questions to answer.
Stations include microscopy (video and dissecting) with live terrestrial and aquatic specimens, keying out compost or freshwater invertebrates using live specimens, working out relationships of compost invertebrates to food chains/webs, life cycle of brineshrimp, observing live marine invertebrates looking at structure and function and adaptations to the harsh marine environment and measuring one or more water quality parameters,
For stage 4 syllabus; the activity relates to producers, consumers and decomposers in Australian ecosystems and how they are related using food chains and webs. For stage 5 and 6 it relates to human impacts on the biotic and abiotic features of the environment and helps give a clear understanding of the role of decomposers in ecosystems.

2. **Aussie Fish tales.** -**Only offered during the warmer months. Offered a class at a time but minimum booking 80 students.**

Students will rotate around several stations where they will:
- Examine adaptations of the introduced fish *Gambusia holbrooki* make it a successful competitor to our native fish. The damage done by this adaptable introduced pest has resulted in its listing as a Key Threatening Process affecting the quality of the aquatic environment.
- Work out the theoretical number of young produced by the exotic *G. holbrooki* compared to native species
- Measure water quality. Water quality has a strong influence on the type of fish to be found in a waterway..
- Use microscopy to observe the development of different stages of live native fish eggs.
- Identify as many invertebrates as possible in a river water sample and assess whether they are predators or prey organisms for fish.

Relates to stage 4 syllabus, describing the adaptations of living things to factors in their environment. Relates to stage 5 syllabus, describing the impacts of human activities on ecosystems. Relates to Stage 6, identifying the most appropriate equipment to undertake an investigation.

3. **Marine Environment and Pollution. Offered a class at a time but minimum booking 80 students.**

A station based activity examining the adaptations of some marine creatures and the effects of pollutants such as plastics on the marine environment. Up to nine stations may be selected from the list below:
-Filtration - Coarse Filtration and Microfiltration
-Oil pollution
-Specific gravity and salinity, and heat pollution
-Nitrate and ammonia pollution
-Plastics Pollution
-Marine invertebrates found on the rock platform
-Seahorses and their relatives
-Keying out and identifying marine invertebrates
-Video microscope examination of marine invertebrates
-Life cycles in e.g. Brineshrimp,
-Carbon dioxide in the marine environment
-pH measurement

## K-6 Teacher PD Workshop - NESA accredited

**Reuse, Recycle, Upcycle**

In this 2.5 hour course for K-6 teachers, Effie will facilitate teachers to develop and use a variety of appropriate resources and activities in their classrooms. Specifically, we use materials that would otherwise be discarded to create working models or other items that illustrate scientific principles. This has the dual effect of assisting the students in the classroom to understand some physics principles while also introducing concepts of resource management such as upcycling and recycling and reuse. The actual activities that will be used are selected on the basis of the way they can engage students in Science and Technology and fulfill the syllabus outcomes for different stages with the added bonus of being good environmental citizens.
We will discuss the practical activities in relation to the syllabus outcomes and risk assessment.
This course has accreditation from NESA, in accordance with this statement:
Completing Primary Science K-6: Hands on Reuse, Recycle, Upcycle will contribute 2 hours and 30 minutes of NSW Education Standards Authority (NESA) Accredited PD in the priority area of Delivery and Assessment of NSW Curriculum/EYLF addressing Standard Descriptor(s) 2.1.2 from the Australian Professional Standards for Teachers towards maintaining Proficient Teacher Accreditation in NSW

**Details of the teacher workshop**
**Course numbers**: Minimum of 20 participants, maximum of 36.
**Duration**: This workshop will be two and a half hours long.
**Where:** At your school OR at another venue (to be arranged).
**Enrolment:** Contact presenter for enrolment procedure for schools or individuals
**When**: During school hours or after school hours, at a date of your choosing.
**Cost:** $70 per person (No GST) if hosted by a school,
or $80 per person (no GST) if conducted at a venue booked by Scienza Viva.

# Aquaponics

***What is Aquaponics?***

Aquaponics is a system that circulates water between a tank of fish and a growing bed of herbs or vegetables. The waste produced by the fish supplies nutrients for the plants, which in turn purify the water for the fish.

***Sustainability***

The systems we offer especially demonstrate nutrient recycling, and in the largest system, the energy needed to deliver the water between the fish and plants will come from a solar panel and battery system. The fish tank and the growing bed in the two larger systems are constructed from upcycled containers.

We offer different aquaponics systems that can be maintained inside or outside, varying in size from 65 to 600 litre water volume, depending on your requirements and available space.

**Presenters of Scienza Viva**

**Effie Howe**
Effie has over 20 years experience as a working scientist in universities and CSIRO, with publications in aquatic biology, physiology, biochemistry and biotechnology. Effie's teaching experience includes developing and teaching environmental biology and biology courses at TAFE colleges and Universities. Effie is also a qualified secondary science teacher.

**Chris Howe**
Chris has over 20 years experience as a working scientist in biomedical research, in hospitals and universities, and for twelve years, worked in sports doping control at the National Measurement Institute in Sydney. He has a deep interest in all areas of science and the communication of science.

## For further details please contact us or look at our website.

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