



# SUSTAINABILITY

Education Kit

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## SUSTAINABILITY + DESIGN

PART ONE: CONCEPTS & PRACTICES

## Introduction

It is important to be aware, as teachers, students, artists, designers and most significantly, as consumers, that sustainability and sustainable development is a new way of thinking about the way we live and how we interact with our world.

Sustainability is often equated with the term 'green' and the idea of recycling, however sustainable design encompasses the entire design process and more. Considerations of sustainability can no longer be thought of as an added extra but is the essential factor of designing responsibly.

There is a fundamental problem with the creation and consumption of designed things - it is unsustainable. As creative thinkers, innovators, inventors, this is the challenge. Armed with awareness, creativity and the foundation of responsibility, design has undertaken a significant shift in thinking and moved into a new and exciting sphere.

This education kit is an introduction to some new ideas and some older ones that focus on designing responsibly. Namely: sustainable design, what that means and the associated concepts. Design can no longer be regarded as either sustainable or not sustainable, it must be responsible. As designers there is significant power in your hands, because if you want, you can change design, and maybe even the world.

The designers featured in this kit all design in a responsible way and consider sustainability in their choice of materials, methods and marketing. Designing responsibly is about ways of working and conducting their business.

Throughout the kit you will find references to symbols, they refer to;



**Enquire**  
Investigate/research.



**Experience**  
The exhibition through questions and activities



**Extend**  
Your knowledge by further research, making, creating and designing.

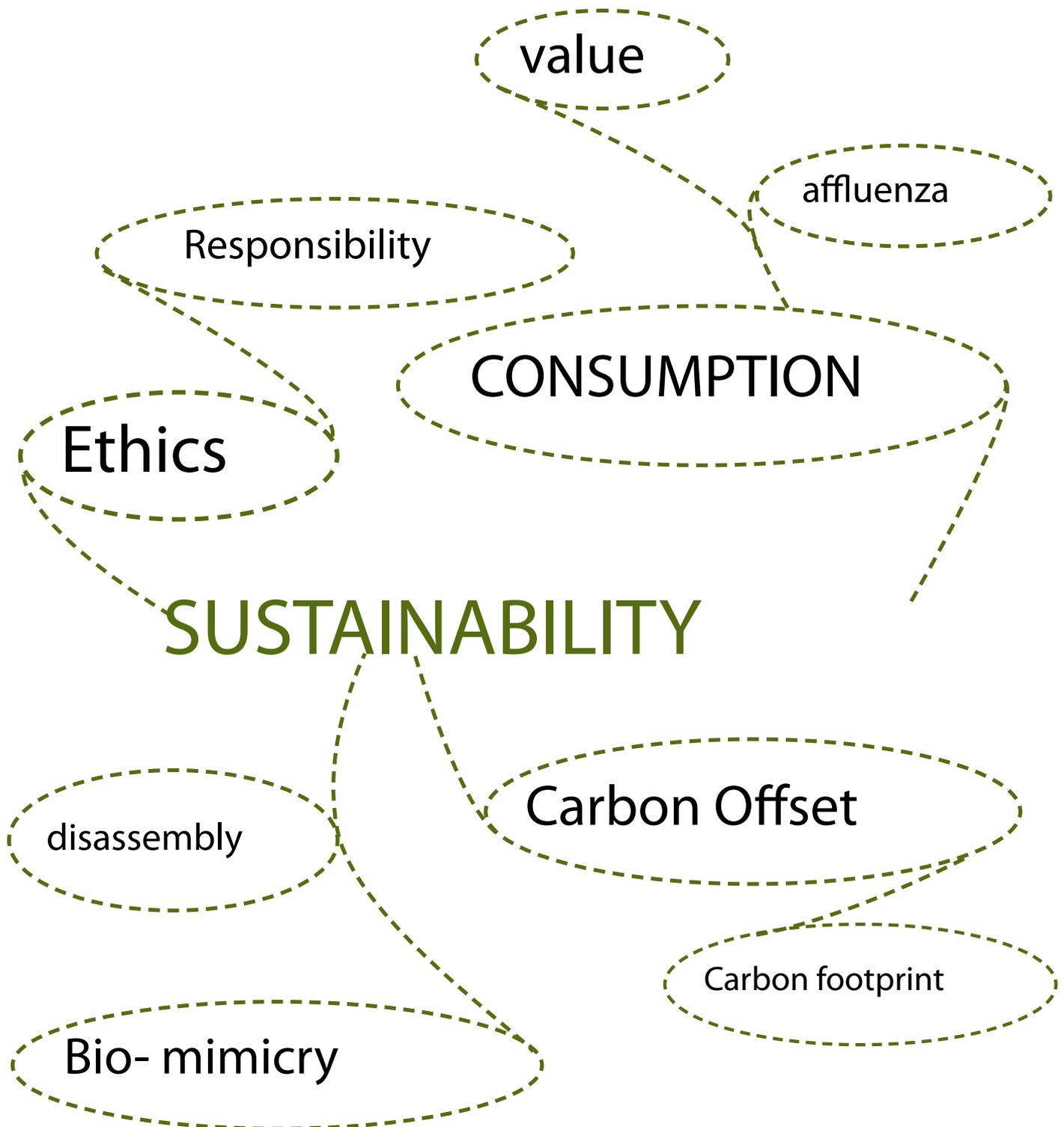
**Education kit developed by Annette Mauer, Learning Coordinator, Object: Australian Centre for Craft and Design**  
**Written by: Imogen Moss**  
**Design: Imogen Moss and Emily Priddel**

The creation of this education kit was made possible through the generous support of the John T Reid Charitable Trusts, The Ian Potter Foundation and The Vincent Fairfax Family Foundation.



### PRINCIPAL FUNDING

Key Terms



## Sustainability

Sustainability can be defined as the ability to be enduring, long lasting or durable. For designers the practice of sustainability encompasses countless aspects of the design process; from the materials they use, the way in which those materials are manufactured, the processes which are employed during production, the conditions of the workers who are producing their products and the life span of the product.

Holistic sustainable design, which encompasses all these elements, is becoming the foundation of many design practices across a range of disciplines.



Digital Eskimo Installation from State. Respond. Exhibition. Object Galley 2010. Photo: Jamie Williams.

1987 World Commission defined sustainable development as;

**“meeting the needs of the present without compromising the ability of future generations to meet their own needs.”**

## SUSTAINABLE DESIGN. CONCEPTS & PRACTICES

At its most basic sustainability can be understood through the following definitions:

**Social:** Social sustainability is the way in which a design practice is enduring for the community; from the local community through to the global community. Many designers and organisations are now recognising the importance of creating systems, such as car pooling, to aid in creating a more sustainable way of living. Systems that also support local industry and recognise the value of local production and community commitment to manufacturing are becoming increasingly important.

**Economic:** Economic sustainability is related to the relationship between local production, fair trade, conditions of workers and how this impacts upon the economics of particular communities.

**Environmental:** Sustainability relates to the impact of what we do in the natural environment. Environmental sustainability is the direct relationship between the acquirement of materials and the cost to the environment (pollution and green house emissions) in attaining and using them. Furthermore, these impact on the wider and sometimes even global ecosystem. In addition, environmental sustainability also relates to waste and the end of life of materials, both natural and manufactured.



Can you find local businesses who are actively creating systems and approaching their practice in a sustainable and ethical manner.



Look for Australian companies who implement environmentally sustainable practices.  
(Hint: Look at raw materials like, timber or textile fibres.)

What are the certifications put in place for Australian companies to ensure that sustainable practices are considered and adhered to?

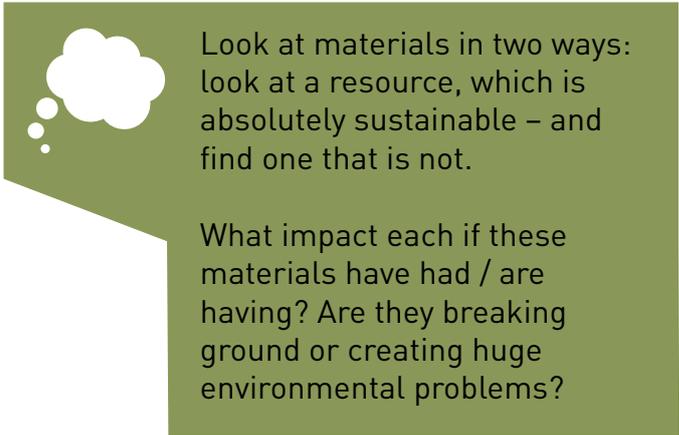
Author Nathan Shedroff puts it simply **“Don’t do things today that make tomorrow worse.”**

# Materials

When looking at materials that are available for use by designers it is important to remember not all materials that seem to be sustainable are sustainable. Materials, both natural and manufactured that are considered to be sustainable are becoming more widespread and varied and increasingly available to designers.

Companies around the world are changing their production methods to ensure that they are producing materials responsibly and ethically. However, when looking for materials for use in a particular project it is necessary to look at a wide range of factors.

For design projects it is essential to look at the entire LCA - Life Cycle Analysis of the material to ascertain the positive or negative value of using that particular material or method. It is also important to remember that "greenwashing" takes place. Beware of **Greenwashing!**

Look at materials in two ways: look at a resource, which is absolutely sustainable – and find one that is not.

What impact each if these materials have had / are having? Are they breaking ground or creating huge environmental problems?

**The easiest way to think about the materials is:**

Where has it come from?

What am I going to do with it?

Where will it end up?

**Can it be recycled?**

To help designers there are websites dedicated to the analysis of materials.

[www.buildinggreen.com](http://www.buildinggreen.com)

[www.ecollect.net](http://www.ecollect.net)

## Carbon Footprint & LCA – Life Cycle Analysis

Carbon footprint is one of the most common terms used by sustainable designers, thinkers and educators. Carbon Footprint is a way of thinking about a product or person in terms of the mark it makes upon the local and global environment. To determine a product's Carbon Footprint you must consider the entire Life Cycle including materials and production, the way the product is used and how it is disposed. The larger the Carbon Footprint the greater the impact that materials, processes and people are having on the environment and affecting it in a permanent way.

[www.lcacalculator.com](http://www.lcacalculator.com)



Choose an everyday item, and draw a life cycle analysis diagram to illustrate the processes involved in producing it. (Don't forget things like freight, electricity and so on.)

Search for companies, which are actively working towards reducing the carbon footprint of their products by reducing the extent of the LCA.

American Apparel and Smart Car, are examples of these businesses / products – how are they reducing the carbon footprint of their output?

### What does it take to make one cotton t-shirt?

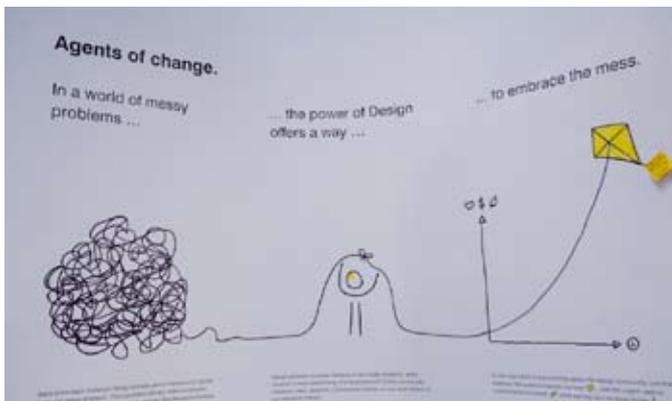
From the planting of the cotton, harvesting, washing, spinning, dyeing, weaving, cutting, sewing, printing, freighting, packaging, distributing and continued washing, drying until finally decomposition – the production of a single t shirt let alone clothes for an entire country or the world is a multi billion industry which requires a vast amount of resources and energy.

# Design Thinking

Design in the past, may have seemed like a solitary profession with the designer sitting in a white studio, with a drawing board developing ideas that would change the world. The roles and responsibility of designers have changed and many now work collaboratively with other designers, manufacturers and communities.

Anything designed – objects, fashion, buildings, graphics is the result of the designer’s ethos, procedures and overall design thinking. In short the design process and outcomes are underpinned by a conceptual foundation.

Find an example of a company whose design thinking (ethics, company policy and so on) has remained the same over a substantial duration of time? Find one, whose ethos is about constant change and evolution?



Design thinking is the process of analysing and assessing the way in which designers work. Furthermore in relation to sustainability it is the process of reviewing the way in which designers as a community approach multifaceted problems, which they then solve in their design solutions.

Design thinking is a reflection of the past, the present and the future. As with any field there are various ways of thinking. Many different opinions and schools of thought and, as a result, a range of design practice. When assessing design ideas you can review the concept, the actual design solution and the longevity of the object and the idea.

These ways of reframing explore how design and designers exist in the wider world. More than ever before design has become embedded in the culture in which we live, there is a greater understanding of the value of design and more discussion and thinking about what we do, why we do it and how design impacts on the wider community.

Digital Eskimo. "Change Agent" from State Respond Exhibition. Object Galley 2010. Photos: Jamie Williams.

## Design for value

What in your mind has a priceless value? Most people have toys from childhood which are invaluable and irreplaceable. The emotional attachment of a toy is not because of the cost of the toy, rather the memories, association and so on create value which cannot be “designed by the designer.” This value may be intended but not always recognised by the owner.

**How can a designer then design with this intention in mind?**

**In a society where consumption is glorified and promoted, how do we associate value with the things that we buy and the way in which we consume?**

**How can designers add sustainability as a quality of value?**



Marc Shamburg: [Schamburg + Alvisse] 0-50 Chair made from recycled E-waste  
Installation at State.Respond exhibition. Object Gallery 2010  
Photo: Jamie Williams



Value is personal. Can you think of an object which has value to you but not to others?

Why does this object have significance?

Can you think of a way to create value for a consumed item?

Can you find companies which add “value” to their products through design or through ethos?

### How does an object have value?

Objects represent value in the physical qualities as well as the emotional qualities they embody. For example, a diamond ring is associated with value, as a product of gold or silver and a precious stone however it is also a symbol of forthcoming marriage and commitment.

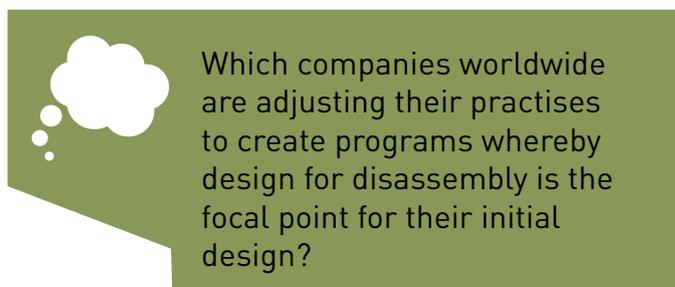


## Design for disassembly

Most everyday objects are made from up to hundreds, even thousands of different types of materials. It takes vast amounts of energy to create the synthetic materials used in products such as computers and cars. It also means that at end of their life these materials take a long time to decompose (if they decompose and disintegrate at all.) Many product parts can be reused by companies for new products, to fix old ones and so on. The problem is that big businesses view the process of breaking down old products and reusing materials too costly and time consuming.

Design for disassembly is about, anticipating and integrating into the design the ability to pull apart and reuse many parts of an object and thus reducing the waste of every element. Essentially, designing with disassembly in mind reduces waste, energy in production. In this scenario the technical and design is formulated in such a way to allow a more sustainable approach to particular design solutions.

**Schamburg and Alvisse's O-50 chair (pictured below) is made from recycled e-waste. The legs from the chair can be removed, the fabric taken off and the body reconstituted into another product.**



**Live Green House is a pre-fabricated structure that can be assembled and disassembled in various places to demonstrate to the public the many ways in which sustainable living can become a reality.**



## Bio-mimicry in design

Bio-mimicry is a design method whereby designers seek innovation through emulating nature. If the aim of sustainable design practice is to be enduring and maintain longevity then it only makes sense to look at the greatest enduring design example: nature.

The natural world including the species, which inhabit it, provides the greatest example of exceptional design. In nature there are very few materials, little to no waste and the entire system is self-sustaining, self-cleaning and rests on a foundation of beauty and aesthetics. Is there any other example of design which can match those credentials?

Bio-mimicry is the practice of looking at the natural world and adopting techniques to design more enduring and sustainable objects and systems. Scientists and designers have developed new technologies such as VELCRO® which take some of the cleverest and ingenious elements from nature.

[www.biomimicryguild.com](http://www.biomimicryguild.com)

[www.biomimicryventures.com](http://www.biomimicryventures.com)



### Where did the idea of Velcro come from?

In the early 1940's, Swiss inventor George de Mestral went on a walk with his dog. Upon his return home, he noticed that his dog's coat and his pants were covered with cockleburs. His inventor's curiosity led him to study the burrs under a microscope, where he discovered their natural hook-like shape.

This was to become the basis for a unique, two-sided fastener - one side with stiff "hooks" like the burrs and the other side with the soft "loops" like the fabric of his pants. The result was the VELCRO® brand hook and loop fasteners, named for the French words "velour" and "crochet."



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## SUSTAINABILITY + DESIGN

PART TWO: DESIGNERS & SUSTAINABLE PRACTICE

## Sustainable Design. Designers & Sustainable Practice

### Bird Textiles

Rachel Bending, the founder and textile designer behind the brand Bird Textiles is no stranger to the idea of sustainability. Rachel is a pioneer of the climate neutral ideology for design businesses and in 2004 created an ethical policy for her company. In Rachel's ethos statement for Bird Textiles she says that:

**Bird Textiles will reinvest both financially and practically in the communities with which it operates; and use environmentally sound manufacturing processes where possible.**

Bird Textiles became one of Australia's first carbon neutral businesses. This was achieved is by offsetting any fossil fuels used in the production, freight or packaging of the company's products, dying fabrics in-house using water based dyes and sourcing cotton milled in India with SKAL certification.

Believing in the notion of environmental responsibility, the Bird Studios located in Byron Bay runs on 100% renewable solar power and Rachel tries to support local industries by sourcing products that are naturally and locally based. Sourcing locally also saves on carbon emissions that are produced in shipping.

Rachel not only helps the environment in the production of her products but the local flora and beach eco systems also serve as inspiration for the label's print designs that are creatively turned into fashion and home furnishings. With a high standard of workmanship in the tailoring and manufacture of these products, Rachel believes that the public is investing in a quality that will last a lifetime.

Harking back to a time when life was much simpler Rachel truly believes that an organic and holistic design ideology for this millennium will improve not only the environment but our appreciation for each object that we own.



#### BUZZWORDS

**Climate neutral:** To offset any fossil fuel emissions used in the manufacture or freighting of the product by donating a monetary amount to an environmental and sustainable cause e.g. tree plantations, renewable energy

**SKAL:** A Dutch certification agency that checks and certifies products that claim to be organic or sustainable e.g. Cotton, Food , Coffee, Forestry.



Bird donates money to the charity Rainforest Rescue: <http://www.rainforestrescue.org.au/> What is the significance of Bird Textiles to an organisation such as this? How does this concept reflect Bird Textiles' environmental policy?

Does your school have a sustainability mission statement? If you were to draw up a charter what ideas would you like to implement? How could your art + design department run like an environmental company?

Look at the company Reverse Garbage in Marrickville Sydney. How could this non profit organization help a company become carbon neutral?

## Sustainable Design. Designers & Sustainable Practice



Every year Bird Textiles releases 3 new fabric patterns. Go to the company website and sketch two of the designs. How would you modify the design in order for the material to be used in a commercial setting such as a school, hospital, or restaurant? What colours, textures, lines and forms would you use?



Photos: Fran FLynn



'The advantage is that there is less impact on the world around us by using something that is natural.' India Flint

Research the work of Botanical Alchemist India Flint @ <http://www.indiaflint.com/> and listen to the pod cast of an interview with India Flint <http://www.abc.net.au/rn/artworks/stories/2009/2613889.htm>

What kind food-dyes does she use in her textile prints? Design a print motif for a tee shirt based on a plant (it may be the bark, the leaf or the flower). Create a food dye to complete the design. Try three methods to extract different colours, shades of colour in the dying process e.g. boil, freeze, or soak in cold water.

Look at the history of dying fabric in Latvia and Japan. What types of methods of dying do they use and what type of natural materials do they use for the colours.

Look at soy based inks in the use of magazine + print media. What are these inks and how are they sustainable and green? What local magazines use green methods of print production?

## Sustainable Design. Designers & Sustainable Practice

### Utopian Creations

Ben Manning from Utopian Creations is a designer that has built a company around a sustainable ideal.

His philosophy: To provide a sustainable service to our customers. We spend our time (at Utopian Creations) researching new technologies, materials and waste products that can be reused, recycled or upcycled.

An excellent example of his 'upcycling' process at work is the way he retrieves used silver from photographic labs. The silver is considered waste material when he collects it, however by carefully reworking and cleaning the silver, it soon moves up the cycle and is refashioned into precious jewellery.

Ben's environmental approach to design is also seen in his eco studio where he reclaims, salvages, and recycles used furniture and materials to equip the interior of the space. With an ingenious approach to re design, Ben cuts, bends and configures many tools and machines from industrial waste. Ben runs The Utopian Creations studio with 100% green power and utilizes rain water run off for its water supply.

This green approach allows Ben to cut the studios running costs, half his consumption of new technologies and slow the globe's carbon emissions. Every detail has been thought about and tested in order for Ben to merge his ideologies for an environmental approach to design, create green low-impact production methods and use renewable source materials.

In the end Ben is creating beautiful contemporary pieces of wearable jewellery without compromising the environment.



#### BUZZWORDS

**Upcycling:** Upcycling is the taking of a material normally discarded and moving it up the resource chain. The material may be recycled into a material of a higher value from its previous use.



Go to the website: <http://www.ethicalmetalsmiths.org/index.html>. What is Ethical mining and how does it relate to jewellery? How can we change the way we use precious metals and protect the environment at the same time? How can designers be leaders in the field of sustainable products?

Look at the blog: <http://www.ecojeweller.org/> To make a sustainable change in the jewellery industry, what must happen first - a shift in awareness, a change in the consumerism and use of materials or a major growth in the technology being developed?



Look at the images of Ben's studio from the Utopian Creations website. What are some of the ways he has tried to be 'sustainable'. Find out more about the Cocoon Series. What was the inspiration behind this collection and what materials have been used? [www.utopiancreations.com.au](http://www.utopiancreations.com.au)

## Sustainable Design. Designers & Sustainable Practice



Look at the website of Mark Vaarwerk <http://vaarwerk.com/> How is Mark sustainable in his jewellery design? Look at the philosophy of Mark's 'Throwaway Project.' What are some of processes he is using to recycle plastics?

Research a material that has the capability of being recycled and refashioned into jewellery. Sketch a collection of wearable jewellery. What is the theme? What materials will be utilized? What are the processes involved in making the jewellery? Is the technology 'green'?

Research the work of Betty Jo <http://www.ambiguoushorse.com/another-cool-artist/> and Liana Kabel <http://lianakabel.com/> ?

What are their sustainable credentials? And how are they similar in their creative + design aesthetic?

Create a collection of neckpieces using a recycled material or object? Who would buy this product? Would they understand the environmental angle to the work? Create a marketing tool such as a magazine page or flash presentation to discuss the sustainable aspects of your jewellery designs.

Previous page: Utopian Creations Eco Studio, interior. Photo: Ben Manning, 2010.

Above: Ben Manning, *Single Cocoon Necklace* and *Cocoon Ring*. 100% recycled pure silver wire and natural fibers. Photo: Object, 2010.

Below: Utopian Creation Eco Studio. Photo: Ben Manning 2010.,

## Sustainable Design. Designers & Sustainable Practice

### Integration Studio

Kent Gratton completed a Masters of Design specialising in environmentally aware furniture design at Queensland College of Art in 2005. After working as a graphic designer with leading design firms in Melbourne and Brisbane, Kent established Integration Studio in 2004 as a vehicle to address social and environmental issues. His Wambamboo range tackles the issues of using non-sustainable materials in the furniture industry by using a renewable resource - bamboo.

All pieces made by Kent for this range use Moso bamboo, a rapidly renewable, durable and environmentally preferred material with referenced use recorded to 3000 BC. It has a rapid growth rate and can be used in a diverse range of applications such as textiles and furniture. It is easy to see why Kent uses bamboo as his primary source material. When not using bamboo he sources other materials that are recyclable, water based or energy efficient, and use low impact production methods.

**“Examples of ecological equilibrium are found in nature and the human race must adopt these symbiotic relationships in order to remain ‘sustainable’ for the future.”**

**Kent Gratton**



#### BUZZWORDS

**Bespoke:**  
custom made or tailored

**Renewable Resource:**  
a natural resource that replaces itself unless overused, in which case it will not have the time or environmental conditions to replace itself. **Timber, unlike mineral resources, is a renewable resource**



What is Moso Bamboo? In what country does it naturally grow? Why is it considered a sustainable material?

What is Integration’s Green star rating system. Discuss how this system may be of importance for design companies to obtain.



Look at Wambamboo’s website at <http://www.wambamboo.com.au/default.asp> Research one of Kent Gratton’s designs. Annotate the product and list the features. Summarise the process Gratton uses to create this range of furniture. Look at how Kent has cleverly allowed his customers to personalize their furniture? In what ways has nature influenced Gratton’s designs?

## Sustainable Design. Designers & Sustainable Practice

In 2007 the *Costello Seat* won the sustainable design award at Melbourne's Fringe Furniture Festival and was accepted into the permanent collection at The Salone del Milano in Italy. The seat is constructed using laminated bamboo, and is hand assembled and finished to create a custom made look.

Kent aims to diminish environmental impact as much as possible and recycles any waste material and water that is created through the process of production. More importantly Kent also tries to minimize the amount of furniture that is manufactured by making pieces that will last.



Above: Kent Gration, *Costello Stool*  
Below: Kent Gration, *Lucille Lounge*  
Images courtesy of Kent Gration



Look at the work of fellow Australian design Mark Harrison from Husque in Brisbane: <http://www.husque.com/husque.html>

Why do you think the Husque range of products could be considered eco-friendly?

Create a light design using a natural fibre or a recycled material. Think about the line, shape, colour, and structure. Draw up sketches and write a report for a webpage on how it was manufactured and why it is a sustainable product.

In 2009 Kent Gration completed a mentorship with David Trubridge in Hastings, New Zealand, further developing and applying his environmentally aware design and production practices.

Visit Trubridge's website and find out about his philosophy, inspiration and design process. <http://www.davidtrubridge.com/>

**Gration's ethos is not about making and selling thousands of cheap mass-produced pieces in order to make a substantial profit. The Wambamboo range demonstrates environmentally aware practices and design for the future, using durable, renewable and tactile materials.**

## Sustainable Design. Designers & Sustainable Practice

### Design Philosophy of the Wambamboo Range

- To highlight bamboo's versatility in its natural and processed states.
- To address the issue of mass-produced synthetic furniture pieces and their sociological and environmental impacts.
- To showcase bamboo as a modern natural material, breaking the connotation of resort style furniture.
- To create a tactile functional piece of furniture which can be sat on, touched and enjoyed, arresting any general austerity that is associated with high-end pieces.
- All processes and materials involved in production must be low impact. This often results in a more limited-run and a hand-made approach to furniture production.



Trubridge states, "We have far too much 'stuff' in our homes, which is little more than junk food designed to leave us only craving more. How can we create real and lasting nourishment without the clutter of useless objects that waste precious resources and damage the environment?"

Make a list of all the things you could dispose of in your home. How could you recycle or donate them or create a shared use system in your local neighbourhood?

Zaishu Studio operates in an ethical manner by providing functional eco furniture with an emphasis on social responsibility.

Look at the company Zaishu at <http://www.zaishu.com/> What is their design ethos? Research the flat pack model and discuss why this may be a sustainable design idea. With the lighting design that you created in the earlier project, redesign your model in order for it to be produced as a flat pack prototype. What material would you now use to create the product and how much energy would be used to create the piece? From your two models for the lighting design project, which would be more sustainable and why?



Kent Gratton reclining on *Lucille Chaise Lounge* with *Abbott Light*  
Bamboo poles, stainless steel frame  
Natural cross laminated bamboo

## Sustainable Design. Designers & Sustainable Practice

### Archology - Live Green House

Terry Bail and Martin Urakawa are two architects on a mission to engage and inform the public on sustainability in architecture, establishing the Sydney based architectural firm Archology to shake up the industry, Terry Bail believes that:

**“Sustainability will come as part of a greater cultural shift away from the disposable society (that we live in today)”**

As we develop a greater awareness of the impact of consumption on the global environment through consumption, we are starting to look for information on how we can convert our existing lives and dwellings into more sustainable models for living. Constructing new urban homes with effective and efficient materials and energy solutions is the first step toward this new social consciousness and the Live Green House is a perfect model of what is attainable.

Changing environmental and energy conditions are important concerns for architects to address and as such Archology decided to create The Live Green House to educate and demonstrate new and sustainable ways to live. Sydney’s Lord Mayor Clover Moore said the idea was to provide realistic guidance for residents.



Sust.org is Scotland`s first dedicated web site to sustainable design in architecture and the built environment. Listen to the information and play the games found on this site.  
 Create a similar game for the Australian environment. What choices would you give?  
 How does your own house rate?  
<http://www.mysusthouse.org/>



Label a photo or drawing of The Live Green House with the guiding principles of the design found on page 20.

List the ways that you could apply these principles in making your own home more sustainable.

<http://www.cityofsydney.nsw.gov.au/Environment/LiveGreen/LiveGreenHouse/Default.asp>

<http://www.youtube.com/watch?v=E5Tdk-20IFA>

Julie Patterson’s design company Cloth provided the curtains and cushions for the Live Green House. Go to her website and research her design philosophy and sustainable practices. Copy one of her designs.  
<http://www.clothfabric.com/>

## Sustainable Design. Designers & Sustainable Practice

The Live Green House is not quite a building and it is not quite a show home yet it clearly demonstrates to the public the many ways in which sustainable living can become a reality. The Live Green House walks the viewer through a full array of green solutions from rainwater tanks, vertical walls, green roofs and balcony gardening to eco linen, cooling paint, green electricity and environmental building materials.



**“During our consultation on Sustainable Sydney 2030, people told us they wanted the Council to head the way on sustainability – but they also wanted practical tools and information to make changes in their own homes.”**

**Clover Moore, Lord Mayor of Sydney 2009**



Describe how the architects have created a sustainable design for this existing building and how they have been able to reduce the energy output to 15% of a regular office building.

Create a video podcast tour of one of your local buildings and describe some of the design aspects that you would change in order to reduce its energy output.

Design an architectural model of the building with its new and sustainable features which you have discussed in your podcast.

Look at the Council House 2 in Melbourne. Watch their virtual podcast tour of the space and describe some of the design features of the building.  
<http://www.youtube.com/watch?v=vJV0wnbAZ6M&feature=related>

CH2 is an example of a new movement in architecture called bio-mimicry because the building mimics nature to reduce it's impact on the environment.

## Sustainable Design. Designers & Sustainable Practice

The Living Green House is a prototype that follows a set of principles of sustainable living.

Some of these guiding principles are:

- Prefabrication of building components to minimize wastage in construction
- The use of plywood and recycled timber for interior fit outs. They are low embodied energy components which means they do not take a lot of energy to create or source. Timber is also low in carbon emissions.
- The use of vegetable gardens and composting of waste materials to reduce greenhouse gas emissions and energy.
- The use of gas rather than electricity.
- More efficient lighting with the redesign of windows in the home to maximize daylight, and the use of efficient light bulbs in every room.
- Recycling of water to reduce wastage and pollution.
- Minimization of heating/cooling with use of improved window and wall insulation. Air filtration also addressed through improved architectural design of the home.

With more knowledge of these sustainable principles, Archology hopes to equip the public with a greater awareness of the ways in which we can change our home environments to better suit our climate, and create a sustainable future for our civilization as we move into the 21st century.



Look at the Surry Hills Library designed by FJMT Architects in Sydney.

<http://www.cityofsydney.nsw.gov.au/Development/CityImprovements/CompletedProjects/SurryHillsLibraryCommunityCentre.asp>

What do they mean when they talk about the building being a 'hybrid model' of design? List some of the sustainable principles on show in the building's design. Draw the environmental-atrium that is a main feature of the library and explain its features. Design an atrium for one of the buildings in your school. How would it help the school to become more sustainable and improve the function of the space?

