CUSP: Designing into the Next Decade is a creative program that explores design as a human-centred approach that can enrich the experience of life for individuals, organisations and communities.

In recent years design has increasingly found application beyond the scope of aesthetics and products. It is also being understood as a way of thinking that has the ability to impact the way we behave and engage with the world.

Designers look deeply at human problems, asking questions, immersing themselves in the environment, devising creative solutions, making prototypes, trialing, testing, and identifying the things that work, discarding those that don’t and starting over – this is the way a designer works.

CUSP focuses on the ‘vision’ of the designer rather than a specific work, placing an emphasis on the process rather than the outcome.

Ranging from architects to fashion, object, interactive, system, robotics and sound designers, CUSP features Australian practitioners who have the potential to influence lifestyle, learning and cultural change in the decade ahead.

This education kit has been developed for secondary students studying a variety of subjects including Design and Technology, Visual Design, Textiles and Design, Visual Arts, Society and Culture, Engineering Science and Geography.

Contributors: Annette Mauer, Danielle Robson, Amanda Picman, Elena Fombertaux.

Identity Design: TOKO

Throughout the kit you will find references to symbols. They refer to:

Enquire by investigating / researching before you visit.

Experience the exhibition through questions and activities.

Extend your knowledge by further research, making, creating and designing.

For information about CUSP visit the website
www.cusp-design.com
What is Australian style and how does Aboriginality fit within our design identity?

Alison Page
Product Design
NSW

Ideas

Alison Page has a vision for the world where Aboriginal cultural stories give rise to everyday design projects. Working in architecture, interiors, jewellery and public art, Page supports the recognition of Aboriginal design as a perspective that honours the origin and intention of Aboriginal stories, and which adds value to design beyond aesthetics or pattern making.

NADA

As a descendant of the Walbanga and Wadi Wadi people of the Yuin nation, Page has worked with various urban and rural Aboriginal communities in the delivery of culturally appropriate architectural and design services. In March 2012, she launched the National Aboriginal Design Agency (NADA) – a unique design hub that creates social, cultural and economic opportunities for Aboriginal communities in the mid NSW North Coast by connecting Aboriginal designers with manufacturers.

CUSP Project

The Sit Place – Living Aboriginal Design, 2013

The Sit Place revisits the Australian home in light of Indigenous belonging, asking “What is Australian style and how does Aboriginality fit within the national design identity?” The installation transforms the center of the home – the living room – into a space alive with cultural meaning. Furnished with everyday objects designed by artists and makers at NADA, the space is transformed into a place of congregation, where people share stories and communicate with loved ones. Each object displayed has a story to tell about the land and its people.

Visit the NADA website
www.nationalaboriginaldesignagency.com.au

What is a social enterprise? What is NADA trying to achieve?

How do their products differ from what you might buy at a gift shop that sells products with designs based on Aboriginal art?

Research one traditional Aboriginal item. What was its purpose? How does it relate to Aboriginal spirituality or storytelling?

Describe ‘The Sit Place’ space. What is your first impression? How does it make you feel?

What stories are being told?

How does this installation support the idea of storytelling?

Sketch some of the designs found in the fabrics.

Design your own special ‘Sit Place’; draw up a floor plan of the space to scale.

Incorporate areas for sharing, connecting and spiritual contemplation. You could relate it to your own cultural background.

Consider what colour, furniture and ornamentation you will have for your space.

CUSP
Designing into the Next Decade

Watch Alison Page discuss product design and her project for CUSP!

http://vimeo.com/68350005

Image credits (from left to right):
Alison Page Portrait. Photo Courtesy of the artist
The Sit Place – Living Aboriginal Design, 2013
Detail of textile from The Sit Place
Photo: George Voulgaropoulos LIGHTBOUND

“If every tree, rock and river has a story about its creation, then our design and building creation stories must be worthy of telling.”
How can we create a common standard for ‘sustainable’ architecture that works for both rich and poor?

“If the consumption of resources in what is accepted as ‘sustainable architecture’ in so-called developed countries were to be applied to buildings in developing countries, the resources wouldn’t suffice. If that is so, the standards set for ‘sustainable development’ need to be reviewed.”

Anupama Kundoo
Architect
QLD

Ideas
Anupama Kundoo is a global architect, advocating a ‘whole world’ approach to housing practices with a strong focus on reducing the environmental impact of building technologies. Central to Kundoo’s work is the cross-cultural exchange of knowledge between so-called ‘developing’ and ‘developed’ nations. Her projects promote building technologies that provide socio-economic benefits to the local area.

Rather than focus on grand architectural forms, Kundoo has immersed herself in the brick-by-brick detail of how structures are built. She researches building techniques that provide socio-economic benefits to communities.

Kundoo’s architectural approach offers a timely and innovative response to the impending global housing crisis, creating affordable and quality housing plans and materials for the majority of the world’s population.

CUSP Project
Light Matters, 2013

Light Matters is a dwelling made using ferrocement, a very thin material consisting of chicken wire encased in cement plaster that is mostly used in boat building. Being significantly thinner than reinforced concrete, ferrocement requires bending and folding of its form in order to achieve strength. To do this, Kundoo draws on the rigid forms of origami crease patterns and explores their potential to add both strength and aesthetic appeal to her built structure.

Other Projects
‘Volontariat Homes for Homeless Children’ in Pondicherry, India, built using ‘fired-mud house’ approach. A highly peculiar building technique, pioneered by ceramicist Ray Meeker, the idea is to build brick houses, not by sourcing brick from factories, but by building large mud structures and firing them on site. The inside of the house is treated as a kiln, stuffed with tiles, pipes, washbasins and toilet fittings, that are then fired and used to complete the house. The advantage of this technology is that it eliminates the need for cement in brick masonry and achieves a permanent house using local skills and materials.

Visit Anupama Kundoo’s website www.anupamakundoo.com and look at other projects she has been involved in. What do they have in common?

Research natural materials that have been used for building. Below is a useful website explaining 10 different natural materials; choose one and create an advertisement promoting the use of the natural material.

http://openarchitecturenetwork.org/projects/dlygad2_nominee-27549
http://www.slideshare.net/prashantChavan5/ad-ppt

Why is it so important to exchange knowledge between cultures?
Research the best ways to insulate a house, what types of natural insulation can be used? List what you find and write a small paragraph of the pros and cons for each.

Explain how Kundoo’s approach to design and the western ideas of sustainability (i.e. ‘greenwashing’ or ‘retrofitting’ an existing home) differ.

Buzz words
Greenwashing and Retrofitting - The addition of new technology or features on older systems i.e. solar panels or water tanks added to homes after they have been built.

Watch Anupama Kundoo discuss sustainable architecture and her project for CUSP.
http://vimeo.com/69440129
How can data help us make sense of our complex world?

“Data Visualisation is a new paradigm of communication where aesthetics, temporality and vast quantities of data are used to provide clarity to complex situations. This is a scale shift – an order of magnitude difference – in thinking about how data and information is presented.”

Image credits (from left to right): Greg More Portrait; Photo courtesy of OOM Creative

Greg More
Data Visualisation
VIC

Ideas
Greg More unlocks the potential of information. In an age where data is more prolific and more widely available, harnessing and transforming information into knowledge is vital for making sense of the world.

Data Visualisation translates massive amounts of complex data into aesthetically pleasing and engaging visual representations.

Data visualisations reveal stories about our world that, once understood, empower us to take action. As a design discipline, it is increasingly vital to business, learning, social, political and cultural areas. It gives us clarity and insight, and the power to make informed decisions about the way that we live.

CUSP Project
Temporal Dimensions: Visualising the Data of Environment, 2013

A series of episodes of current and past visualisation projects that represent data around a number of environmental issues. These include how drought is reflected in urban water storage statistics, the number of trees at risk in our urban forests, and where coral is most vulnerable in our oceans, and why? Trawling though pages of hard data may lead you to answers. Alternatively, take a moment to view More’s visualisations and you will most likely arrive at the same point in a matter of minutes, or even seconds. Such is the power of visual communication.

Other Projects
Visualising Water Systems, 2010
In collaboration with Melbourne Water
OOM Creative designed a series of data visualisations to illustrate 10 years of urban water usage. These were exhibited in real-time installations and large scale prints.

We were interested in how data could tell a story over time. We discovered that placing the water data in circular formations generated intriguing and informative shapes; working both as graphics and animations. Each day of the year is arranged clockwise around a circle, and then the values for rainfall, reservoir storage, river level and sewerage are plotted on these days. Immediately you see how the seasons shape our water supply, the amount of variation there is in a decade, and how our behavioural patterns affect the water output from the city.

OOM Creative

Visit Greg More's website to familiarise yourself with data visualisation and look at his other projects. www.oomcreative.com

Look at this short video explaining data visualisation and its history http://www.youtube.com/watch?v=4dS2Jzb-aX8

Compare two sets of data, one in a traditional format and one depicted through data visualisation. How can data tell us a story?

Visit http://visual.ly and look at the different ways data has been presented. Choose one example and explain how the designer has translated data into a visual format.

Visit Aaron Kobin’s data visualiser.
www.aaronkoblin.com/work/flightpatterns/index.html

Watch "Flight Patterns Colour" that looks at the flight paths of air traffic over North America. Try to analyse the information. What do the different colours represent? Why do the number of flights decrease then increase rapidly?

Survey your classmates on a specific topic i.e. music, movies, sport etc. Using www.infogr.am.com determine how you will visually represent the results using infographics.

Can design humanise medical technologies?

Leah Heiss
Therapeutic Object Design
VIC

The emotional experience of the user of medical technologies is of paramount importance to Heiss. Early in her research, she discovered that many people opt out of wearing or using their devices – such as hearing aids or medical jewellery – because they are unattractive or loaded with social stigma. By re-imagining them as sought after design objects – although with far better technical performance than the existing devices – Heiss removes the visible signals of ‘disability’ and ‘illness’ and puts the choice to reveal a condition back in the control of the wearer.

By working between medical technology, jewellery aesthetics, spatial design and advanced manufacturing, Heiss is able to develop extraordinary technologies that improve the experience of life for those that rely on medical aids.

CUSP Project
Close to Me: Designing for Health and Wellbeing, 2013
CUSP profiles a range of Heiss’s projects.

Diabetes Jewellery

Diabetes Jewellery is an exceptional example of one of her aesthetically pleasing medical designs. Crafted as a desirable piece of jewellery, Diabetes Neckpiece is an alternative to a syringe, functioning to painlessly administer insulin to diabetes sufferers using nanotechnology. The Diabetes Jewellery includes a necklace and a ring. The necklace is a wearable applicator device that applies NanoMAPS to the skin. The rings are designed to keep the insulin patches against the skin once they have been applied.

See a demonstration of how the Insulin Ring works at http://www.youtube.com/watch?v=KBHjPOISPbg.

Heiss’s ‘therapeutics’ range includes: a series of hearing technologies for the hearing impaired; high performance medic jewellery; an ECG necklace to discretely measure heart rate; and her Seed Sensor, which is a swallowable device that unfurls in the digestive tract like a flower, collecting bubbles of gas that can be an early indicator of disease.

Each prototype uses the advanced manufacturing technique of 3D printing. If an initial design attempt doesn’t meet the criteria, Heiss changes it, and reprints it until she arrives at the best design solution.

Visit Leah Heiss’s website www.elasticfield.com and research one of her other projects. Draw a diagram of the design and annotate how it works.

Research Nanotechnology. What are the main applications of the technology?
What is experiential/human-centred design?
How do we consider glasses? Are they medical devices or have they become something else?
Heiss’s designs are created using 3D printer, research what a 3D printer is, how it works and what type of objects it can create.

How do Heiss’s designs change the user’s experience? Why is it important to think about the user’s experience?

Analyse the factors that influenced this innovation.

What is your first impression of her work? How does the display setup support her designs?
Describe Heiss’s approach to the finished product.

Buzz words
Nanotechnology – technology that deals with dimensions less than 100 nanometres, building devices from single atoms and molecules.
Therapeutic – Having or exhibiting healing powers.
Aesthetics – a branch of philosophy that deals with the nature and expression of beauty.
NanoMAPS – small 10mm x 2mm circular discs, which have a collection of micro needles on their surface.

All of Leah Heiss’ designs are working prototypes. Research what prototyping involves and why it is a vital part of the design process.

Design an advertising campaign for one of Leah Heiss’ designs. This could be in the form of a poster, short film clip or a PowerPoint presentation pitch to a new market.

Design an addition to the Diabetes Ring to further personalise it. You may incorporate a gemstone or a sculptural design or symbol.

Research existing medical devices such as hearing aids, and insulin syringes. Compare them to Heiss’s designs.

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Can clothing accumulate experience and memories over time?

MaterialByProduct rejects the fashion industry status quo. In a trade where collections are typically produced biannually, only to be superseded a season later, MaterialByProduct offers year-round continuity and timelessness. And despite the mass production and waste characteristic of the industry, this luxury fashion house is testament to the power of thinking differently.

MaterialByProduct director and master artisan, Susan Dimasi, concentrates on systematic techniques for marking, cutting and joining cloth to create exquisitely crafted, environmentally sensitive pieces. For CUSP, Dimasi presents a new and exciting technique – that of ‘accumulation’. This means clothing evolves and increases with value through a long term relationship with the wearer rather than being fixed and ‘fashionable’ for a time.

Other Projects

BLEED, 2012

In 2012 MaterialByProduct unveiled the BLEED project, a series of garments marked by hand with a coloured marker, which then ‘bleed’ into the fabric when activated by the body heat of the wearer, accumulating detail over time. Emotional states such as love, passion, frustration or anxiety trigger increases to body temperature, which stimulates a change in the MaterialByProduct cloth. The final result for the fashion client is not merely a wearable garment, but a unique and intensely personal record of their psychological journey through life.

CUSP Project

EMBODIMENT, 2013

For CUSP, MaterialByProduct presents EMBODIMENT, the second project to explore the notion of ‘bleed’. Two public figures have been invited to wear a MaterialByProduct dress and publicly document their emotional experiences over the course of three months. The private musings of the wearer will be broadcast via social media and blogs for audiences to follow. Once the journey is complete and the fabric has bled, MaterialByProduct will digitally scan the unique pattern and create a new textile design from which new MaterialByProduct garments will be made. Only after purchasing the dress and cracking open the sealed tag will the identity of the original wearer be revealed.
Can we think bigger, more imaginatively, and more creatively about sustainability?

Could epic ecological machines be the answer?

“I’m fascinated by creating food producing, zero waste landscapes and adventure playspaces, which challenge contemporary views on play and risk taking.”

Stephen Mushin

Industrial Design
VIC

Mushin describes his work as an exercise in ‘intelligent dreaming.’ In one corner of his world reside projects designed to operate within real-world constraints – water shortages, food shortages, hostile climates and urban density. In another corner, radical design ideas for a future where every wild possibility is technically possible. His ‘living machines’ germinate, functioning as possible solutions to issues relating to climate change.

CUSP Project

Now, If, What, Then – Illustrations, 2013

Often, climate change solutions concentrate on what we’ve got to go without, or quit doing altogether. But what if the solutions on offer are more appealing?

Mushin’s ‘future living machine’ drawings. Now, If, What, Then illustrations, illustrate how climate change solutions can be made more fun and appealing. His fantastical ecological machines are bordering on the absurd, reminiscent of Leonardo da Vinci’s then-absurd flying machine drawings. A suspended taxi-cum-milkshake-café powered by farting cows removes the abundance of methane from the atmosphere, while a floating polar bear habitat in the ocean made out of recycled refrigerators has the dual benefit of saving the polar bears from extinction whilst also farming them for ethical polar fleece jackets. Mushin has meticulously researched his ideas to ensure that they are scientifically possible.

Aquaponics Ecology Project, 2013

Mushin’s most recent ‘real world’ project is a zero-waste, human-powered, low-cost aquaponics system for growing food in developing countries. Mushin is working with engineer Neil Faragher and biologist Dr Wilson Lennard to design a system using as few non-biologically recyclable components as possible.

This proved quite difficult, as plastics are extremely handy. The installation of photographs and specimen jars reveals the ethical design process, which helped them weigh up issues of material choice, cost and environmental impact to create the most sustainable and accessible aquaponics system on the planet.

Visit Stephen Mushin’s website and familiarise yourself with his aquaponics projects and other ventures he is involved in. http://stephenmushin.com/

Research aquaponics and how they are being used.

Mushin is not limited to designing; he is involved in puppeteering and working with local communities to promote environmental awareness. List some of his other projects.

Look at the installation of photographs and specimen jars. What do they tell us about the ethical design process?

Look at Mushin’s illustrations. Why does he refer to them as ecological machines?

How does humour play a part in his illustrations?

Which other designers in this exhibition also work in cross-disciplinary areas? Why is it beneficial to collaborate with people from other fields?

Why does he refer to them as ecological machines?

Buzz words

Aquaponics – A sustainable food production system that combines conventional aquaculture, (raising aquatic animals such as fish or crayfish in tanks), with hydroponics (cultivating plants in water) in a long term interaction. The waste from the aquaculture is filtered from the water by the plants and returned clean to the fish.

Look into Mushin’s Mildura’s Eco-living Centre design.

Design and create a future living machine for your school, explain how it limits wastage and performs tasks.

Redesign your local park into an eco friendly area. You might like to think about how to capture and use rain water or how the play equipment might be used to generate energy or have multiple functions.

Work in groups and prototype a structural design for housing a vegetable garden in your school. Research where it will be most suitable.

“Can cities be organisms that respond and adapt to their environment?”

For Chris Bosse, architecture is not about the shape of a building, it is about the intelligence of a system. He envisions a world where buildings mirror the biological world and can respond to external influences like air pressure, temperature, humidity, air pollution and solar radiation. In his ‘future city’, buildings are not singular structural entities (designed, serviced and accessed as isolated units), but part of large networked system, where the whole is greater than the sum of its parts.

Bosse draws on biomimicry, a science that studies nature’s systems and processes - soap bubbles, snowflakes and spider webs - and uses the designs to solve human problems.

For more information visit http://l-a-v-a.net/

Florian ‘Floyd’ Mueller is designing a new form of play that bridges both the digital and physical realms. He believes play is a fundamental part of what makes us human, and this principle infuses his vision of an array of interactive ‘games’ that push players to reach a greater potential.

As Director of the Exertion Games Lab at RMIT University, Mueller and his team blend play, gaming and sports thinking to create fun, physically intense experiences that increase motivation, social connectedness and health.

Exertion games such as Nintendo’s Wii demonstrate current ideas of how technology can engage us physically. Mueller’s lab, however, looks into the future and asks, “How we will play a decade from now?” This liberates the Exertion Games Lab from commercial restraint, allowing Mueller’s team to explore fresh possibilities for physical, psychological and social outcomes for players.

For more information visit: http://exertiongameslab.org/

Buzz words
Biomimicry – A new science that studies nature’s models and then uses these designs and processes to solve human problems.

Exertion – Physical or mental effort
Simulation – Imitating a situation of process limited by time.
‘Can interactive art and design reduce the pain and anxiety experienced by children undergoing painful medical procedures?’

George Khut
Interactive Art & Design
NSW

George Khut creates body-focused artworks that help us re-imagine who we are, and how we can be. Combining human-centred design and electronic art, Khut produces digital works that translate physiological data into compelling sound and light experiences. By making the invisible visible, Khut gives us greater awareness of our bodies and reveals the wonder of the biological world inside us.

For the past decade, Khut has been researching the creative potential of biofeedback - a method of observing subtle changes within the body such as heart rate, brain waves and blood pressure - so that we can influence the body function we are monitoring.

CUSP project
BrightHearts, 2011-13

Unlike most interactive games, which intensify mental and physical activity, the challenge of the BrightHearts App is to feel as relaxed as possible. The App measures changes in your heart rate using a pulse sensor attached to your earlobe. It becomes animated with colourful visuals and relaxing sounds each time you relax and slowly exhale. This is known as a biofeedback loop.

The *App* is designed to help seriously ill children manage stress and anxiety while undergoing painful procedures. With practice, patients become familiar with the biofeedback system and are able to manipulate how their body reacts to stress with the help of the visualisations.

For more information visit http://georgekhut.com/

Buzz words

Biofeedback – The process of gaining greater awareness of many bodily functions by using instruments that provide information on their activity, with a goal of being able to manipulate them at will. Some of the processes that can be controlled include brainwaves, heart rate and pain perception.

Interaction Design – An emerging practice that is concerned with those aspects of the design that shape people’s experience when they use interactive technology.

Healthabitat
Architecture
NSW

Healthabitat uses design to map the relationship between health and housing, and in doing so dramatically improve the lives of disadvantaged communities.

Project

When directors Paul Pholeros, Paul Torzillo and Stephan Rainbow visited the Anangu Pitjantjantjara Lands in north-west South Australia in 1985, their brief was simple: “Stop people getting sick.” Their ensuing design methodology, known as Housing for Health with ‘Nine Healthy Living Practices’ at its core, links health to housing function in a bid to improve health and wellbeing in communities.

In addition to preventing people from falling ill, Healthabitat has statistically debunked the myth that the poor state of housing is the result of neglect or abuse by inhabitants. In actual fact, more than 90% of faults in houses are due to poor design or lack of maintenance. From Australia to Nepal and New York, the Housing for Health program has proved that the health and social issues faced by these communities are not linked by race, but by poverty. In the face of this, Healthabitat remains focused, almost three decades later, on improving living environments in order to improve community health.

For more information visit http://healthabitat.com/

Buzz words

Social design – A design process that contributes to improving human well-being and livelihood.

‘Can design help prevent people from getting sick?’

Watch George Khut discuss interactive art and design, and his project for CUSP.
http://vimeo.com/68355846

Image credits (from left to right).
George Khut Portrait. Photo: Julia Charles
Bright Hearts Prototype iPad App. 2011, heartrate controlled interactive visuals for iPad (visualisation software by Jason McDermott). Photo: Julia Charles

Watch Paul Pholeros discuss how architecture and health can work together, and hear about Healthabitat’s project for CUSP.
http://vimeo.com/89052237

Image credits (from left to right).
Paul Pholeros Portrait. Photo courtesy of the artist
9 Healthy Living Practices, 1989, ink on card. Photo courtesy of the artist
What is intelligence, and how can it be passed on?

Mari Velonaki
Creative Robotics
NSW

Mari Velonaki is fascinated by the way humans and machines communicate. Having worked as a researcher and artist in the field of interactive media for almost two decades, her artworks encourage relationships between living and non-living things.

For CUSP, Velonaki has zoned in on the field of artificial intelligence, which historically has largely focused on the transfer of human knowledge to machines. Knowledge and intelligence are different things however. Whereas knowledge is understood as information that has been acquired in order to complete a task, intelligence broadly describes our ability to reason, learn, experience emotions and exercise self-awareness.

CUSP Project
Blue Iris, 2013

In late 2012 Velonaki embarked upon a research project titled Blue Iris, which aims to create an interactive wallpaper that can sense human touch, sound, breath and marks made on its surface. In response, the wallpaper will weep, change colour, display (and rearrange) text and drawings. It becomes the active skin of a ‘living’ system – an evolving memory bank that collects human-machine communication and data.

For more information visit http://mvstudio.org/

Super Critical Mass
Sound Based Performance Art
NSW & QLD

Super Critical Mass formed as a reaction to the strict hierarchy that defines classical music. Spectators are typically guided into designated listening areas and offered strict codes of engagement, and are therefore limited to how they listen to music. The performance-installations of Super Critical Mass seek to challenge the traditional social and spatial hierarchies that characterise our experience as musical spectators.

The performance-installations of Super Critical Mass reject these systems. Simple algorithmic instructions are given to the performers such as where to move or what notes to play in what order, leaving listeners free to wander through the dispersed musicians.

CUSP Project
Pivotal (from me to you and back again), 2013
multi-channel video

In June 2013, Super Critical Mass created a performance work in Casula, Sydney, with local volunteers. This event was documented and has been recreated as a ‘virtual’ mass, replacing the real human beings at the original performance with digital doppelgangers that are placed sporadically throughout the space. You are left free to roam through the ‘orchestra’, constructing your own path between the towers.

For more information visit http://www.supercriticalmass.com/

Buzz words

- Artificial Intelligence – The study and design of ‘intelligent agents’ which is a system that perceives its environment and takes actions that maximize its chances of success.

- Hierarchy – A system or organisation in which people or groups are ranked one above the other according to status or authority.

- Sensorial – Involving or derived from the senses.

- Algorithmic – A process or set of rules to be followed in calculations.

- Doppelganger – Someone who looks identical to someone else.

‘Can design change the way we listen? Can listening change the way we design?’

‘Here, music happens with and around you, not at you.’ – Julian Day, Co-director, Super Critical Mass

Watch Super Critical Mass discuss ... their project for CUSP.

http://vimeo.com/68418256