Partnerships

Without the resources and expertise of many professionals, projects at this level would not be possible. The Education Department and Department of Culture and the Arts recognises the importance of partnerships when developing arts and education programs.

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Everal Alderman
ArtsEdge Program Coordinator
SymbioticA
Science Fuses with the Arts

The aim of this education pack is to inform readers about the latest developments in art and science and how these can be used as a resource for teaching and learning. This area of arts creation is a relatively new frontier that questions moral and aesthetic issues. It also questions our preconceived notion of what art is.

The aim of this pack is not to give opinion but to inform and present the ideas and works of artists developing new projects in this field and to show ways in which teachers and students can use these experiences when creating their own works and ideas.

Education Issues

Many of the concepts presented have originated from using Bio Feel as the means of inspiration. Application and interpretation will vary depending up audience. Look at the needs of your students, your own interest and understanding of the concepts. The education pack aims to show you ways of interpreting this material in traditional and non traditional arts forms.

Links to the curriculum framework have been made throughout this document. Integrated learning through Science and English is extremely valuable in this project. Refer to examples of how learning experiences can be applied in all areas from K to 12.

“The art in BioFeel goes beyond the fantasy of the surrealist project. The artists are dealing with the actual wet palette of possibilities of life manipulation offered by biotechnology.”
- Oron Catts, BioFeel curator

Education Perspective

The ideas and issues discussed in BioFeel are applicable to a number of classes: art, science, electronics, biology, human biology, history, literature, film, computer science, social science and theology.

Sources to use when discussing the works:

Texts: Aldous Huxley’s Brave New World, Mary Shelley’s Frankenstein, Zadie Smith’s White Teeth.


Social issues: The use of living biological systems for homocentric ends; plastic surgery and changing the body for aesthetic reasons; using human and animal bodies as spare parts; ethnic cleansing; modern day holocausts; genetic engineering; animal and human rights; theology and philosophy; aspects of creation.
What is SymbioticA?
SymbioticA is an artist-run laboratory within a biological science department. It was established in April 2000 with the idea that it would act as a porous membrane in which art and bio-medical sciences and technologies could mingle. Artists are encouraged to employ biological techniques as part of their practice. SymbioticA evolved from the Tissue Culture and Arts Project model of co-operative and collaborative (rather than competitive) research.

SymbioticA offers a new means of artistic inquiry, one in which artists use the tools and technologies of science, not just to comment about them but to explore their possibilities. The art here goes beyond the fantasy of the surrealist project. The artists are dealing with the actual wet palette of possibilities of life manipulation offered by biotechnology.

With SymbioticA, artists work in the different laboratories in the school, such as the molecular biology, tissue culture, neuroscience, biomechanics laboratories and a biological imaging facility (IAAF). Artists will also have access to CTEC, the state of the art training facility for surgeons, the Hill International Surgical & Medical Workshops, and a VR haptics room. SymbioticA welcomes artists, scholars, undergraduate and postgraduate students from all disciplines to work in interdisciplinary research teams, exploring new directions for new technologies and their effects on society.

SymbioticA is generating collaborations that have no other place to evolve. It is a dynamic, organic organisation where participants contribute their knowledge and expertise.

Biological technologies are becoming a major part of our lives, and predictions claim that this will have a profound effect on our relationships with all living systems. The application of knowledge, acquired through directed research in life sciences, seems to be driven by forces that are interested in short term gains for the few, often neglecting long-term risks.

The use of knowledge gained as part of basic and profit driven research into living systems seems even more alarming in the light of the war clouds hovering above. In addition to the obvious threat of biological warfare, the apparent decline in compassion makes our times perilous to make decisions about the manipulation and use of living systems. These decisions will determine the kinds of relationships we will form with the living world around us.

As biological research departments in universities are encouraged by governments to partner with “industry” and “defence”, the need for research into non-utilitarian purposes becomes urgent. The exploration of possibilities is important to the understanding of the ways technology may develop. By fostering artistic critical engagements with biological research, SymbioticA provides a greenhouse for developing alternatives to the commercial mainstream.

Wet Biology Art Practice engages with the treatment and manipulation of life and living systems using the tools of modern biology. It is closely tied to the current developments in modern biological technologies, the ethical and epistemological issues and dilemmas that arise from new scientific knowledge and from the application of such knowledge as part of biotechnology.

Wet Biology Art Practice incorporates the actual physical manipulation of living systems as opposed to 'merely' representation or a simulation of such concept. "Getting hands wet" and experiencing the phenomenological aspects of manipulating life is a central element in Biological Art. The Tissue Culture & Art’s exploration of the use of living tissues and the creation of Semi-Living entities opens up a space for new discourse into the extent of manipulation of living systems. The integration of these semi-living entities and live human performers would undoubtedly create tensions indicative of society's confusions concerning the implications of the use of new biological technologies.
Introduction

Within our lifetime we have seen the body morph into a malleable mass: rhinoplasty, lung transplants and breast enlargements are no longer met with shock and awe. But advances in controversial new areas such as gene therapy and cross-species genetic manipulation have reunited the debate about how far humans should interfere with nature. Contemporary art moves into this brave new world when PICA exhibits the largest living tissue biological art exhibition in the world.

A new breed of artist has migrated from studio to laboratory to explore the new palette biological and medical technologies offer. A working laboratory will be set up in the main space of PICA to cultivate living tissue into art.

SymbioticA Research Group experiment with the capabilities of a rat’s neurone.

The Tissue Culture & Art Project present their evolving Pig Wings and the birth process of semi-living Worry Dolls.

Adam Zaretsky (USA) debuts MMMM – an installation that stimulates more than just your mind.

Amy Youngs (USA) armors a nude cactus in her sculpture Rearming the Spineless Opuntia.

Marta de Menezes (Portugal) sculpts self-portraits with the make-up of her proteins.

Andre Brodyk’s (Australia) installation derives from biotech industry warehouses, laboratories and research facilities.

Arts Response

Students use their aesthetic understanding to respond to, reflect on and evaluate the arts.

- How do new art-forms and styles emerge?
- Make up a new idea for an art-form or period. What would you call it?
- What makes art contemporary?
- Give this style of art a name eg. Surrealism, Dada-ism, Realism...
- Write a critique of the exhibition for your local paper. What would you tell people about the exhibition?
- Blindfold a friend and lead them to a work in the exhibition – tell them everything you see. Describe the work using your other senses as well. When you un-blindfold them, ask them to tell you how accurate your description of the work was.

Links to Science

Investigating

Students investigate questions about the natural and technological world using reflection and analysis to prepare a plan, to collect, process and interpret data, to communicate conclusions and to evaluate their plan, procedures and findings.

Communicating Scientifically

Students communicate scientific understandings to different audiences for a range of purposes.

Each artist, with humour and irony, critiques the science facts and fictions of our brave new world.
Science Fuses with the Arts

Background

The genetic modification of pigs for the purpose of transplanting their organs into humans (xenotransplantation) opens up a space for the creation of ambiguous beings. The Tissue Culture & Arts (TC&A) Project (Oron Catts, Ionat Zurr and Guy Ben Ary) plays with the idea of science making the impossible possible. By cultivating pig bone-marrow stem cells into miniature models of wings, TC&A anticipate the horrific (bat wing), the angelic (bird wing) and obsolete (dinosaur wing) potentials of a world where organs are made to order and pigs might fly.

The work evolved from Catts’ and Zurr's residency in the Tissue Engineering & Organ Fabrication Laboratory, Massachusetts General Hospital at Harvard Medical School. An ongoing research and development project, it examines the use of tissue technologies to create semi-living sculptures. Catts, Zurr and Ben-Ary have won international and national acclaim for their artistic experimentation and research over the last six years in the Tissue Culture and Art Project. (www.tca.uwa.edu.au).

They continue their artistic experimentation within SymbioticA at the University of WA and have recently been named finalists in the World Technology Awards for Arts 2002.

BioFeel: art and biology

This installation takes on an added dimension, with frogs’ hearts giving the Pig Wings movement.

Other work in the exhibition includes SymbioticA Research Group’s MEART (aka Fish and Chips) - rats’ neurones automate a robotic arm, raising questions of whether a semi-living cybernetic entity can be as creative and unpredictable as the mind of a living being.

Amy Youngs' (USA) Rearming the Spineless Opuntia gives a manipulated spineless cactus armour to protect it from humans.

Marta de Menezes (Portugal) uses human chromosomes as a new form of portraiture.

André Brodyk's (Australia) installation DNArt uses genetically modified bacteria, and an interactive experiment explores the effect of vocal vibration in Adam Zaretsky's (USA) MMMM...

“The art in BioFeel goes beyond the fantasy of the surrealist project. The artists are dealing with the actual wet palette of possibilities of life manipulation offered by biotechnology.”
- BioFeel curator and artist, Oron Catts
MEART
(aka Fish and Chips)

SymbioticA Research Group
Guy Ben Ary, Phil Gamblen, Dr. Stuart Bunt, Ian Sweetman, Oron Catts, Ionat Zurr, Gil Weinberg, Matt Richards and Thomas DeMarse
www.fishandchips.uwa.edu.au

Take some embryonic rats neurons, place them over silicon chips, connect to visual and audio art output devices and what do you get? Can we really call this an artist? Can a semi-living cybernetic entity be as creative and unpredictable as the mind of a living being?

The research and development of this hypothesis continues at PICA and a laboratory in Georgia, Atlanta.

A series of experiments will be performed in order to explore the relationships between the input of music, images and other stimuli and the output of the robotic drawings of the neurons of a rat.

Links to Science
Investigating
Students investigate to answer questions about the natural and technological world using reflection and analysis to prepare a plan; to collect, process and interpret data, to communicate conclusions and to evaluate their plan, procedures and findings.

MEART Activity
- Take a scientific framework, propose some hypothetical questions, and work out how you might go about finding the answer.
- Don’t be deterred by the impossibility, complexity or sheer ridiculousness of your question.

Arts in Society
Students understand the role of the arts in society
- What is the role of the artist in society?
- Who determines what is art?

Arts Ideas
Students generate arts works that communicate ideas
- Create a piece of music or art that uses unconventional techniques and skills.
- Record your ideas and processes
Arts in Society

Students understand the role of the arts in society

• Study the work of the Surrealist period.
• What similarities can you see between the BioFeel artists and the Surrealists?

Surrealism

Surrealism is the period between the World Wars, begun by André Breton, with René Magritte, Max Ernst and Salvador Dali. Their painting style smashed all the elements together with a demented sense of humor. Typical drawings include trains coming out of chimneys and melted clocks.

"The movement represented a reaction against what its members saw as the destruction wrought by the "rationalism" that had guided European culture and politics in the past and had culminated in the horrors of World War I. Surrealism was a means of reuniting conscious and unconscious realms of experience so completely that the world of dream and fantasy would be joined by the everyday ration world in an absolute reality, a surreality." - Piocch

TISSUE CULTURE AND ARTS PROJECT

Oron Catts, Ionat Zurr and Guy Ben Ary
(www.tca.uwa.edu.au)

The TC&A Project is an ongoing research and development project examining the use of tissue technologies to create Semi-Living sculptures. These semi-living objects consist of synthetic materials and living biological matter from complex organisms. These sculptures blur the boundaries between what is born and what is manufactured, what is animate and what is inanimate, and further challenges our perceptions of our bodies and constructed environment.

“Our project is about life, a dialogue with life’s different levels, and the notion that we are all made out of communities of cells. It is an important part of our practice that we need to care for our semi-living sculptures.”
- TC&A

The tent laboratory is a circus top that you cannot access. You are excluded from the show – the peep holes restricting your view to the complete laboratory. It is a sombre spectacle allowing the voyeuristic observance of the creations within. The artists, who at feeding time work within the tent, are dressed in lab coats. Yet the colour is not the pristine white we associate with science, but the grey of the labourer and mechanic.

Are the artists mediating between art and science? Or are they removing the haloed existence scientists (based on the general public’s ignorance) operate in?

TC&A ask questions about the extent to which we can morally manipulate and exploit living biological systems for human-centric activities. Will the emergence of the Semi-Living make our society a more caring one, or will life become objectified even further?

PIG WINGS – plays with the idea of science making the impossible possible. By cultivating pig bone-marrow tissue into models of wings, TC&A anticipates the horrific (bat wing), the angelic (bird wing) and the obsolete (dinosaur wing) potential of a world where pigs could fly.

Pig Wings by the Tissue Culture & Art Project
Surrealism and Science

"The creative process, so far as we are able to follow it at all, consists in the unconscious activation of an archetypal image and elaborating and shaping the image into the finished work. By giving it shape, the artist translates it into the language of the present and so makes it possible for us to find our way back to the deepest springs of life."

- Carl Jung
- Uncovering the Self, By Mariu Suarez, 48"x24", Oil and egg-tempera on canvas

Art has always been an integral part of humanity's great quest for knowledge. The interchange of knowledge between artists and scientists has led to many of our most important advances. For example:

- It was artists' zeal to perfect their craft that led to a better understanding of human anatomy. Masters of the human form, such as Michelangelo, broke social taboos and laws to study the human body by dissecting corpses. This research became a vital part of medical knowledge.
- Geographers and map-makers created mathematical grids to make accurate maps. Artists used that innovation to translate three dimensions into two dimensions.
- It was painters who discovered the principles of optics, by examining how the eye sees in order to better "trick" the eye with their images.

Another important interaction between arts and science began at the beginning of 20th Century. A medical doctor, Sigmund Freud, discovered the "psyche" or "soul" while trying to find the cause of his patients' unusual symptoms. Psyche is the Greek equivalent for Anima, the Latin word for soul. Both refer to something metaphysical – beyond the physical, invisible to our eyes.

Freud unwittingly rekindled an interest in the metaphysical realm, which science had shunned in its quest for knowledge. He then endeavored to study it in the same way the physical level had been, by applying reason. One of Freud's most prominent disciples, Dr. Carl Jung, further developed the field of psychology and the understanding of the psyche.

Freud and Jung began a new era by mapping the threefold constitution of man - the Spiritual, the Psychic, and the Material. They brought to the forefront the contents of the psyche as represented in ancient mythology and symbolism, and taught us that the psyche can be understood through reason.

While Freud laid the scientific groundwork, Jung explored how the unconscious reveals itself though symbols. Artists, once again, were needed to join the quest for knowledge. Jung himself painted and sculpted his dreams and visions so that he could better understand them.
Surrealism and Science

Dissecting the Psyche

Jung's theory of the human psyche is that it is made up of three parts: the ego (conscious mind), the personal unconscious, and the collective unconscious.

[The collective unconscious is] "...the reservoir of our experiences as a species, a kind of knowledge we are all born with. And yet we can never be directly conscious of it. It influences all of our experiences and behaviors, most especially the emotional ones, but we only know about it indirectly, by looking at those influences. The contents of the collective unconscious are called archetypes. An archetype is an unlearned tendency to experience things in a certain way. The archetype has no form of its own, but it acts as an 'organizing principle' on the things we see or do. The archetype is like a black hole in space: You only know it's there by how it draws matter and light to itself."

- C. George Boeree, Ph.D.

Self Discovery Through Art

For the purpose of personal analysis, Jung talked about not judging the images of the subconscious, but simply accepting them as they came into consciousness so they could be analyzed. This was termed Automatism.

Artists were fascinated by the implications of these new psychological theories. They understood from them that the unconscious had important messages for the conscious mind, but that the former communicates through images (symbols and archetypes) while the latter communicates through language.

Supraconsciousness, By Mariu Suarez, 62"x22", Oil and egg-tempera on canvas

Surrealist artists wanted their work to be a link between abstract spiritual realities and the real world. To them, the object stood as a metaphor for an inner reality. Through their craft - be it painting, sculpting or drawing - artists could bring the inner realities of the subconscious to the conscious mind. Just as Michelangelo and Leonardo advanced knowledge of the body's anatomy, surrealist artists strive to chart the anatomy of the psyche.

Everyone can use art to bring forward messages from their own personal unconscious. The vital role of the artist is to help us all see the messages which come from the collective unconscious.

"Therein lies the social significance of art: It is constantly at work educating the spirit of the age, conjuring up the forms in which the age is more lacking. The unsatisfied yearning of the artist reaches back to the primordial image in the unconscious, which is best fitted to compensate the inadequacy and one-sidedness of the present. The artist seizes on this image and, in raising it from deepest unconsciousness, he brings it into relation with conscious values, thereby transforming it until it can be accepted by the minds of his contemporaries according to their powers."

- Carl Yung

For more information check out this website: http://www.bway.net/~monique/
Worry Dolls

Tissue culture and artificial wombs grow live tissue on worry dolls. The viewer is invited to confess their worries to these semi-living creatures. Is giving birth to worry dolls truly cathartic?

“The Guatemalan Indians teach their children an old story. When you have worries you tell them to your dolls. At bedtime children are told to take one doll from the box for each worry & share their worry with that doll. Overnight, the doll will solve their worries.

Remember, since there are only six dolls per box, you are only allowed six worries per day.”

Creating our worries
TC&A decided to give birth to seven dolls, as we are not kids anymore, and surely have more than six worries.

The genderless child-like dolls represent the current stage of cultural limbo. They were given alphabetical names as we think we can find a worry for each letter of our alphabet.

While working on the Tissue Culture & Art Project, people expressed to us their anxieties. These dolls represent some of them.

Doll A = stands for the worry from Absolute truths, and of the people who think they hold them.

Doll B = represents the worry of Biotechnology, and the forces that drive it. (see doll C)

Doll C = stands for Capitalism, Corporations

Doll D = stands for Demagogy, and possible Destruction.

Doll E = stands for Eugenics and the people who think that they are superior enough to practice it.

Doll F = is the fear of Fear itself.

G= is not a doll as the Genes are present in all semi-living dolls.

Doll H = symbolizes our fear of Hope…”

Share your own worries with the dolls. (You may have more than 6 too…)

Arts in Society
Students understand the role of the arts in society

Guatemalan Indians - Did you know?
The Central American country of Guatemala is one of the most linguistically diverse in the world. 500 years ago, Guatemala was ruled by the Mayas. There was actually never a Mayan empire, but rather a loose collection of city-states, each with its own language. In 1523 the Spanish showed up. Within 20 years they had conquered most of the country, although a few remote pockets held out into the 1600s.

Guatemalan Indians have continued to wear their traditional everyday costumes. They are well known today for the skill of their weaving and their masterful way of combining bright colors in their clothing. The Indians’ colorful clothing is an important part of their culture. Different towns and regions have their own particular designs which immediately identify not only what language group the wearer belongs to, but also specifically where the wearer comes from.

However, Indian clothing is not quite as traditional as it would first appear. The different designs - over 200 of them - were introduced by the Spanish as a way of keeping track of which village or town a peasant belonged to. (Simon, 1987)

www.swl.net/patepluma/central/guatemala/guatlg1.html
Worry Dolls
Tissue culture and artificial wombs

How were they created?

The worry dolls were hand crafted out of degradable polymers (PGA and P4HB) and surgical sutures. The dolls were sterilized and seeded with endothelial, muscle, and osteoblasts cells (skin, muscle and bone tissue) that are grown over / into the polymers. The polymers degrade as the tissue grows. As a result the dolls become partially alive!

Will they take our worries away?

Each doll’s transformation cannot be fully predicted and it is unique to itself. Our dolls are not clones but rather unique.

Art(ificial) Wombs and the next sex…

This is the age of loss of innocence. We are pushing our humanistic traits of curiosity and manipulation, trying to reach the ultimate border. We are learning to manipulate the building blocks of our own (and other organisms) bodies.

The next sex, created in the artificial womb, may be a cold calculated act for the “best” sex. This procreation would be remote from the sacred, emotional ritual of what we consider sex today. The artificial womb, located outside of the body (equally separate from the male and female bodies), will be where the act of procreation occurs. We will costume design the womb to represent our individuality, and become emotionally attached to it since this is the place of the real act of sex.

"Will we still attach to sex so much importance, or will we be, at last, free from sex as a compulsory act for creation. We might be able to physically (and mentally) free ourselves from the ‘natural’ binary constraints of sex to create new forms and new plays."

Possible futures with biotechnology?

In this age of rapid leaps in knowledge and technology, what might our society be like in the future? What will the next decade hold for us? Already we have seen a woman whose biological clock has stopped ticking, attempt to replicate a beloved dead son through IVF treatment. Already children are being created for bone marrow and spare parts to save their ill sibling. It is said that at this moment, a cloned foetus is incubated in a surrogate mother – the result of a wealthy man’s curiosity? Will human clones, like Dolly the sheep, age at a rapid rate? And who is the parent?
Photographs of an ordinary-looking lamb named Dolly made front pages around the world. Dolly, unlike any other mammal that has ever lived, is an identical copy of another adult and has no father. She is a clone, the creation of a group of veterinary researchers. That work, performed by Ian Wilmut and his colleagues at the Roslin Institute in Edinburgh, provided an important new research tool and shattered the belief that cells from adult mammals cannot regenerate a whole animal. Although the researchers have made clear that they consider it unethical to adapt their technique to clone humans, the demonstration has raised the prospect that others might not be so scrupulous. Cloning humans could mean that women could reproduce without any help from men.

Debatable Issues

Would you choose to be cloned?

- If yes - why?
- If no - if your life depended on receiving a part from a clone would you agree?
- Do you believe xenotransplantation is justified? (transplanting organs from one animal to another?)

Rights of the living (human & animal)

“Let Man have domination over the fish of the sea, and over the fowl of the air, and over every living thing that moves upon the earth”
- Genesis, Old Testament

- Should man dominate living things?
- Should animals have equal rights to human beings?

Some animals are more equal than others...

“They talk about leaps and bounds in the field of medicine yada yada yada, but bottom line, if somebody knows how to eliminate “undesirable” qualities in people, do you think some government’s not going to do it? I mean, what’s undesirable? There’s just something a little fascist about the whole deal...where are we going here? Millions of blonds with blue eyes? Mail order babies? I mean, if you’re Indian like me you’ve got something to worry about, yeah?...”
- White Teeth, Zadie Smith.

In Australia, this mythical land of egalitarianism, are some animals more equal than others?

Is a Russian Olympic-standard diver seeking refugee status incarcerated in a Detention Centre?

Who will we accept as true-blue – Pauline Hanson, Ernie Dingo, John Williamson?

The threat of nationalism erupting in war in Australia is most unlikely, but what of the situation in Croatia, Ethiopia and Israel and Palestine?

Does the security of being the most isolated city in the world make the issues less pressing?
The one who painted himself insecure to others kept using the word toast
As if to beg the power of a talisman to coat his shack with bullet-proof transparency.
If victimed by the fact of a transparency.
Many acres since have been inhaled into his possession.
Headlock mates with slides the heart's eye makes.
He races to unfinished lines before his hypothetical opponents can consider factual arrivance.
Do they make fun of his cleats, his hand tooled pistol, vats of acid he owns shares of.
Do they make fun of eyes that fathom poverty
as he has known it and consistently misplaces into future tense.
Do they see all the way into his bones to know no blue blood
he would feign can swim in that vicinity. Do they reduce or see him evenly.
The one with life to prove yet wears a pet proof winter in which shepherdy
behavior leaks a frothed blue breath above the cars.
Would any shoulder minus sainthood let his head be there.
He wouldn't question custom.
Only would continue his embodiment of big screen things no one can tender
very long inside a heart however stretched toward forgiveness.

Sheila E. Murphy
Adam Zaretsky (USA)

Music and Science

Vibratory Arts Research is more stimulating than it sounds. In MMMM... (Macro / Micro Music Massage) the audience is invited to become part of a live experiment by vocally vibrating each other's rear ends.

Zaretsky’s favourite artistic offering to public experience is “the reinsertion of fun for fun’s sake into the social.”

Sit back, relax and put yourself under the microscope.

Adam Zaretsky is the first international artist to reside within SymbioticA. MMMM... continues his research into the effects of music and sound on tissue cultures. He has just finished teaching a course - VivoArts: Art and Biology Studio - as a Professor of Conceptual / Information Arts (C I A) at San Francisco State University and as an Honorary Visiting Researcher at the University of Western Australia.

Artist’s Statement

I have gotten interesting results from playing Engelbert Humperdinck's Greatest Hits for 48 hours at a time for 25 ml of an industrial strain of E.coli. I use some vibrating plate speakers from Acouve, a Japanese company that makes vibro-musical chairs for Sony. It appears that the production of antibiotics may have increased.

There are multiple explanations for this, being narrowed down through further experimentation. One possible cause could be that the "Humperdinck Effect" is caused by annoyance.


The cells may be bothered by being subjected to loud, really awful lounge music for two days straight. Then, they may produce antibiotics to fight against a perceived enemy the only way they know how.
- Adam Zaretsky

Arts Response

Students use their aesthetic understanding to respond to, reflect on and evaluate the arts.

Vibrating sounds

With a partner, sit down on both couches.

Place microphone near mouth. Take it in turn to make the following noises:
- chatter teeth
- breathe heavily
- sing
- yell
- improvise

How does the couch make you feel? Massaged? Titillated? Embarrassed?

Do your reactions match each other? Or are you surprised at the other person’s expressions?

Point of discussion...

British Airways has just recently put sensors in their seats so passenger’s discomfort can be sensed and reported by the air staff before air-rage occurs.

Would this stimulation of tissue create an unhappy butt or a constant smile on your face?
If Fuzzy Wuzzy had no hair, could he still be Fuzzy? How about a Prickly Pear with no prickles? This species of Prickly Pear has the typical ovoid pads but they’re nice and smooth.

Through cloning, humankind has engineered creations such as the spineless opuntia, a cactus that lacks it original defense mechanism – its spikes. Youngs has sculpted a mechanised armour to protect its vulnerability.

*Rearming the Spineless Opuntia* lures the viewer closer – but once a presence is sensed the nude cactus’ armour snaps shut. Unlike the Venus Fly Trap that captures food for sustenance, it is mechanical construct that protects the living being within from the danger of further human interference.

**Artist’s Statement**

*The plant inside this device is both interactive with people and protected from them. Its metal armor closes up when approached and opens when people move away from it. Through cloning and micropropagation technologies, humankind has engineered creations such as the Spineless Opuntia, a cactus that lacks its original defense mechanism against those who eat them. This sculpture embodies my impulse to protect this vulnerable, human-engineered creation. But it also reveals the folly of protection in its heavy reliance on technology.*

Reviews of Youngs’ work have appeared in the Chicago Reader and Artweek, and her articles have been published in Leonardo and Nouvel Objet. She has lectured nationally, including at California State University, Long Beach and the Massachusetts Institute of Technology.

Youngs is currently an Assistant Professor of Art at The Ohio State University.

**Discussion Points**

Why do you suppose a spineless cactus was engineered?

Can you think of any other genetically modified plants?

What could be the reasons for changing plant forms? eg beauty, longevity, greater success in food production, profit.
Activity

Think of ways animals and humans protect themselves?
• Make noise - hiss like a cat / rattle like a snake / growl
• Change physical appearance – bare teeth, camouflage skin, retreat within a shell
• React – bite / hit / attack / run

Think of a plant / person / inanimate object that you think requires protection?
• Protection from what?
• Design a protective barrier for your chosen protected species.

Other Projects…

Hyperdomestic Cacti

These are selections from a series of works that project humankind's aesthetic ideals of nature onto real and fictitious cacti. Taking existing examples of human engineering such as strangely altered grafted cacti and genetically enhanced, human-friendly spineless cacti, this body of work imagines the possible future permutations of these living forms.

Now that we have engineered a spineless cactus (widely available at Home Depot nurseries), we may begin to miss the beauty of the spines and so design the next version to include soft, ouch-less spines.

Perhaps we will engineer future houseplants - our surrogate nature - in ways that enable them to show us their emotions or desires, or reflect ours back to us. Indeed, it is possible that our new creations could affect us in ways that bring about a greater appreciation for, and conservation of, the non-human world.

Hyperdomesticates I & II 1998 (10” x 14” x 7”)
A live, grafted cactus (right) consisting of five distinct varieties, posing next to a rubber cactus with real cactus spines. Urethane elastomer, cactus spines, clay, rocks, grafted cacti (5 varieties), plastic, soil and wood.
NUCLIART
Marta de Menezes (Portugal)

“We are witnessing the birth of a new form of art: art created in test-tubes, inside laboratories.”

Rather than the oils, gouache and the camera, de Menezes incorporates biological material: DNA, proteins and cells as new media to explore novel ways of representation and communication. Her portraits take us deep within ourselves to see whether a brain scan can depict who and how we are, and whether our molecular makeup paints a better picture of ourselves than the representative nature of photography / traditional portraiture.

Marta de Menezes is a Portuguese artist with a degree in Fine Arts from the University in Lisbon, and a MSt in History of Art and Visual Culture by the University of Oxford. In recent years, she has been exploring the interaction between Art and Biology. Working in research laboratories, she has demonstrated that new biological technologies can be used as new art medium, and proved that laboratories can be art studios. Besides researching into new ways to create art, de Menezes is also an accomplished artist using traditional media, with paintings frequently representing insights from scientific research.

Portraiture
Arts Ideas
Students generate arts works that communicate ideas

Find a portrait of someone, who is not famous, and write a short paragraph on who the person is.

• What are they like?
• What do they do?
• What is their personality?
• Explain why you make these decisions.

Arts in Society
Students understand the role of the arts in society


• How would you like to be portrayed?
• What feature would you want the artist to concentrate on? Your eyes? Hands? Clothes? Bedroom? Study? In the nude? Without you in the picture at all?
• Why do you choose this aspect?
• Does this feature identify you physically / psychologically / socially?

Arts Skills and Processes
Students use the skills, techniques, processes, conventions and technologies to the arts.

• If Marta de Menezes painted your portrait she may choose to paint your brain activity. Choose an activity that you expect would portray you at your best. (Menezes had a friend play the piano in order to paint her brain portrait).
• Can you think of other physical and biological ways in which to take someone’s portrait?
There is an eerie quality to *DNArt*. As a series of buildings of biotech conglomerates flash on the wall, glowing boxes with microscopic viewfinders beckon you to view within. But rather than bringing the contents closer, inside, the drawings of dna structures seem eons away. It is only a peek at dna structure, as if seeing is not revealing.

Other Artists Exploring the Frontier

**Radioactive Biohazard: Reinterpreting Biotechnology as Art Exhibit**
University of Michigan Warren Robbins Gallery

**The System Forgets Scientists**

**Laboratory Installation** Hunter O'Reilly, Ph.D. and Electric Eye Neon, 2001-2002

The laboratory bench installation includes actual products of scientific experiments such as DNA visualized with UV light, preserved laboratory animals, x-rays and vials used to store radioactivity. This work reveals and explores the strange surroundings of a scientist, and may begin to explain what causes at least some scientists to lose their moral grounding with respect to the science they pursue. This work also discloses how subjectivity and politics influence scientific investigations.

**Genetic Artists**

Through my studio based research I have developed five categories of Genetic Art and Artist. This work is manifest as follows:

(1) Virtual sense
(2) Physical sense
(3) Biotechnology with living
(4) Merger of Biotechnology and living with digital technology.
(5) Synthetic organic / inorganic recombinant ready mades.

For further information on Andre Brodyk read his paper on Genetic Art and Culture.
But is it art?

A recent review told us to “suspend our usual art perspective” (Broadsheet, Vol 31 no 2) when looking at biological art. But ever since the late 19th century, the audience has been challenged to look at works not perceived as traditional art.

A Monet print in a million bedrooms was a shocking and daring thing in its time. So too Jackson Pollock’s work, which 50 years later, despite his standing in art history, has not had mainstream acceptance.

At how many exhibitions have you overheard “I could have done that” or “but is it art?”

In no other area is this question used to quite the same extent as in the arts. Is it science? Is it television? Is it food? What constitutes art? If it looks beautiful? If it shows skill? Will it match your décor? If it makes you think? A combination? Discuss.

What is Art?

In the early 20th century all traditional notions of artists and art were thrown into disarray by Marcel Duchamp and his Dada associates.

Duchamp, as an artist, declared that anything the artist produces is art. For the duration of the 20th century, this position has complicated and undermined how art is perceived. At the same time it has fostered a broader, more inclusive assessment of art.

Dada (1916 - 1923) A western Europe artistic and literary movement that sought the discovery of authentic reality through the abolition of traditional culture and aesthetic forms. http://www.arthistory.sbc.edu/artartists/artartists.html

Leo Tolstoy (1828 - 1910), although best known for his literary works, Tolstoy also wrote various essays on art, history, and religion.

In order correctly to define art, it is necessary to first cease to consider it as a pleasure and to consider it as one of the conditions of human life. Viewing art in this way helps us observe that art is one of the means of intercourse between humans.

Every work of art causes the receiver to enter into a relationship both with the producer of the art, and with all those who, simultaneously, previously, or subsequently, receive the same artistic impression.

If a man infects another or others by his appearance or by the sounds he gives vent to at the time he experiences feelings; if he causes another man to yawn when he himself cannot help yawning, or to laugh or cry when he himself is obliged to laugh or cry, or to suffer when he himself is suffering - that does not amount to art?
SymbioticA
Pre-visit & Post-visit brainstorming & discussion topics

When faced with new or non-traditional art forms, we are less confident of being able to trust or talk about what we see. Don’t forget that visual art is just that – an optical engagement. So start by discussing the most obvious elements of the work first. For example –

- How is it made?
- What is it made of?
- What materials / art processes / art forms are used?
- How does it sound? Smell? What does it fell like?
- How is it presented?

When we talk about art, we use an arts language.

When we talk about science, we use a science language

Brainstorm examples of arts and science languages.

Think about where they may meet.

Are the artists in the BioFeel exhibition having to create their own language. For example, their use of the term “wet palette.”

Gallery Visit & Post Visit image analysis, brainstorming & discussion topics

- What do you like about the work?
- How does the work make you feel?
- What aspects of the work have meaning for you? Think about symbols, images, slogans, objects, text, light, sound.
- What issues is the artist discussing in the work?
- Can you identify anything that has influenced the artist’s work? Think about other artists, art movements, scientific discoveries, social events, books, films, etc.
- Think about the medium and techniques the artist the artist has chosen (biology, electronics, etc). Do you think the choice of medium or technique is vital to the work?
- Do you think the artists could explore the same issues using traditional mediums?
Society Imitates Art

These artists can be seen to be exploring future possibilities by using the tools and technologies of science.

A future possibility explored in *BioFeel* is that one day we may be able to purchase pig wings as a fashion accessory.

**A story of an upper class girl, 2028**

By Ionat Zurr & Oron Catts

...It was her 16th birthday and she knew that from today she would finally be able to get a legal implant (most of her friends had one already). She had been planning that for a while.

A few months ago she went to the Implants Farm and checked the catalogue and the displays. She knew immediately what she wanted: a pair of decorative wings. Just like those of hamster-bat she got for Christmas when she was ten. The farm's practitioner took a biopsy from her inner-thigh and then showed the scaffold design. "Would I fly?" she asked. He laughed, "Ho no, that will require a complete redesign of your body and even then you will only be able to glide. These wings are designed to go with the current fashion of backless dresses." "What about these feathered wings?" she inquired. "I don't think your parents have the budget" he replied "and, beside, they will not grow with you, they are for adults only."

It was a regular procedure and the risk of contamination was reduced to less than 3%. The farmer took her behind the office, to the implants growth factory. She looked through the glass window to the sterile farm, where pigs with different body parts seamlessly attached to them lay in pools of clear liquids. He showed her to "her pig". She immediately liked "her pig". It was smooth and its skin colour was just like hers.

The farmer explained that the pig carried human genes to increase human-pig compatibility. She trusted the pig to carry and grow her wings till they would be grafted back to her.

**Beyond today?**

- What other future possibilities can you see the *BioFeel* artists are exploring?
- The pig wings possibility could be seen as a form of plastic surgery. Is plastic surgery art?

Discuss what happens when a work of art or fiction become a scientific prophecy or possibility.

An example of a future possibility becoming a scientific fact is Aldous Huxley's *Brave New World* (1932) - a science fiction / satirical story that predicted examples of biotechnology that exist today.

- Do you think artists expect their work to become real, scientific possibilities?

There is a lot of debate about biological technologies in the news at the moment ie cloning, stem cell research, and so on. These sort of issues raise ethical questions.

- For example, if it's technically feasible, what's wrong with using biotechnology to let us grow pig wings to be attached to humans?
- Biotechnology can make us smarter, happier - and nicer. Discuss.
BRAVE NEW WORLD?
A Defence Of Paradise-Engineering

*Brave New World* (1932) is one of the most bewitching and insidious works of literature ever written.

Is this an exaggeration?

Tragically, no. Brave New World has come to serve as the false symbol for any regime of universal happiness.

For sure, Huxley was writing a satirical piece of fiction, not scientific prophecy. Hence to treat his masterpiece as ill-conceived futurology rather than a work of great literature might seem to miss the point. Yet the knee-jerk response of "It's Brave New World!" to any blueprint for chemically-driven happiness has delayed research into paradise-engineering for all sentient life.

So how does Huxley turn a future where we're all notionally happy into the archetypal dystopia?

If it's technically feasible, what's wrong with using biotechnology to get rid of mental pain altogether?

Brave New World is an unsettling, loveless and even sinister place. This is because Huxley deliberately endows his "ideal" society with features likely to alienate his audience. Typically, reading BNW elicits the very same disturbing feelings in the reader which the society it depicts has notionally vanquished - not a sense of joyful anticipation. http://www.huxley.net/

Other web sites… (quite advanced) http://www.bltc.com/

Just thinking aloud…

*Homo sapiens, the first truly free species, is about to decommission natural selection, the force that made us.... Soon we must look deep within ourselves and decide what we wish to become.*

Edward O. Wilson
*Consilience, The Unity of Knowledge*

"Universal happiness keeps the wheels steadily turning; truth and beauty can't."

Aldous Huxley
*BRAVE NEW WORLD*

"I can sympathise with people's pains, but not with their pleasures. There is something curiously boring about somebody else's happiness."

Aldous Huxley
*LIMBO : 'Cynthia'*