



Architecture meets Nature

Creative Learning
Teacher Resource



Resource Overview

This learning resource can be used for Primary students and supports multidisciplinary learning across Visual Arts, HSE, Geography, Science and Technology.

This resource includes discussion questions and activities designed for the classroom but can be adapted to suit the needs of your students and teaching context.

Workshop Overview

General capabilities and cross-curriculum priorities

Creative and Critical Thinking

Students are invited to draw and think like an architect, using natural forms as inspiration to build models and explore how the natural world can solve design problems.

Problem-solving

Students explore how architects can solve problems by observing the natural world. Taking inspiration from Jørn Utzon's biomimicry approach, they apply design thinking to create buildings that respond to climate change and work with their environment.

Sustainability

Students work with found, recycled, and natural materials, embedding sustainable practice into the making process. This workshop will focus on biomimicry, environmental design, and how architecture can respond to climate change.

Ethical Understanding

Students consider how architecture can shape a more sustainable future – exploring responsibility to communities, ecosystems, and the environment through global perspectives in design and placemaking.

Workshop Overview

What students can expect – sensory elements

Touch

- Direct handling of found objects and recycled materials
- Drawing with pencils, pens, and other writing tools
- Cutting, shaping, and assembling 3D prototypes
- Varied textures: cardboard, fabric, plastic, natural materials

Sight

- Images of the Sydney Opera House and natural forms (birds, shells, cliffs)
- Bright, well-lit workshop space
- Colourful and varied materials displayed
- Visual demonstrations by facilitator before making begins

Sound

- Facilitated group discussions
- Collaborative making activity
- No amplified music or loud sound events during the workshop
- Enclosed indoor space at the Centre for Creativity

Movement

- Mix of seated and standing activities
- Moving between workstations during the making phase
- 90-minute session – no break built in

Glossary

Biomimicry

Design that takes inspiration from nature to solve human problems. Jørn Utzon used biomimicry when designing the Sydney Opera House, drawing on the shapes of shells, birds' wings, and the cliffs of Sydney Harbour.

Biophilia

A human connection to the natural world. Biophilic design brings nature into buildings through natural materials, light, and organic shapes.

Pavillion

A pavilion is a light-weight, usually open building, used for shelter and relaxing or for concerts and exhibitions. It is usually a temporary structure, adding on to an existing building or any public space.

Prototype

A first attempt at a design – something you make to try out your ideas and see what works.



**A (very) brief history of the
Sydney Opera House**

Tubowgule

Now known as Bennelong Point

The Gadigal people in Warrang/Warrane (Sydney Cove) call the place around the Opera House 'Tubowgule' – meaning the knowledge water.

Tubowgule was a point located at the end of a long, wide ridge and surrounded by rocky shoals that mostly covered at high tide.

The Gadigal believe that the coming together of the saltwater (from the Pacific Ocean) and freshwater (from the Parramatta River) creates a surge of energy and nutrients – making the Sydney Harbour an ideal spot for fishing, eating, meeting and sharing stories.



Tubowgule

Now known as Bennelong Point

Being close to the harbour, cove, freshwater creek and mud flats, the area was rich in resources. This included oysters, mussels, fish, possums, wallabies, kangaroos and many edible plants.

Aboriginal people gathered and ate these foods over thousands of years, leaving behind shells and animal bones that formed 'middens' around Sydney Harbour



Whispers, 2023, Megan Cope, Sydney Opera House.

This was an art installation of a midden made of 85,000 repurposed oyster shell waste and other natural and recycled materials.

The Sydney Opera House

A building nobody thought was possible

In 1956, the NSW government held an international competition for a new performing arts centre on Tubowgule, now known as Bennelong Point.

Over 220 entries arrived from 32 countries, and the winner was a Danish architect named Jørn Utzon.

Today, the Opera House is a World Heritage-listed building and the country's number one tourist destination.

It welcomes more than 10.9 million visitors a year and hosts more than 1,800 performances attended by more than 1.4 million people.



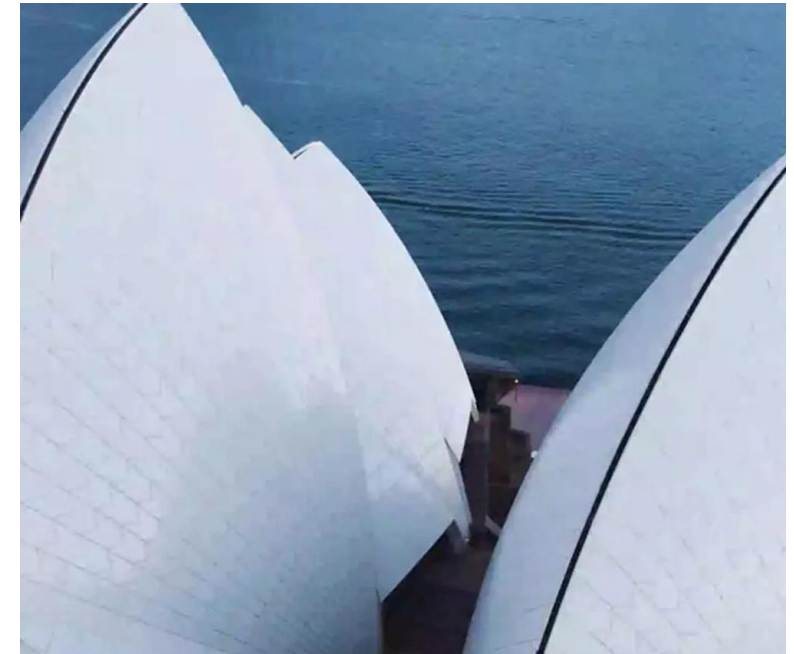
Jørn Utzon

The vision: shells, sails and nature

When designing the Opera House, Jørn Utzon was inspired by nature. The way an orange peels apart, the curve of a nautilus shell, the wings of a bird, the colours of the sunrise, and the sunset.

Utzon was also interested in how designs inspired by nature can shape the visitor experience.

He wanted the building to bring joy, transport people to another world, offer a sense of detachment from the city, and create moments of rest.



Activities



Discussion Questions

Primary students

Look at the Sydney Opera House. What natural shapes can you see in its design?

Can you think of any buildings that remind you of something in nature? What do they look like?

What makes a design sustainable?

What problems do you think climate change creates for the way we build cities?

Activity 1

Take students outside and ask them to find three natural forms to sketch – a leaf, a rock, a branch, anything that catches their eye.

Next to each sketch, write some words that describe its shape and structure – spiraling, layered, strong, flexible.

Bring students back together and ask a few to share their sketches.

What shape did you notice most?

Did anything surprise you when you looked closely?

Could any of these shapes or structures be used in a building? How?



Activity 2

Students choose one of their natural forms and sketch a building feature inspired by it.

It does not need to be realistic or buildable. Encourage wild ideas!

If students are stuck:

What if a roof worked like a leaf?

What if a wall was structured like a honeycomb?

What if a building grew upwards like a tree?

Students label their invented feature with its name and the natural form it came from.



Reflection



Exit Questions

What did you learn today?

Name one thing in nature that could inspire a building design.

What does biomimicry mean in your own words?

Explain it to someone in the classroom.

Finish this sentence:

"A sustainable building is one that..."

Can you think of a building in your neighbourhood or town that was inspired by nature?

What does it remind you of?

Key Learning Areas Curriculum Map – NSW Syllabus Outcomes

Architecture Meets Nature Workshop – Stage 2–3

Creative Arts (Visual Arts) Stage 2 – 3 (Yr 3 – 6)	Mathematics Stage 2 – 3 (Yr 3 – 6)	Science and Technology Stage 2 – 3 (Yr 3 – 6)	Human Society and its Environment Stage 2 - 3 (Yr 3 – 6)
CA2-VIS-01 Makes artworks using art forms to represent subject matter and ideas, and describes ways artists convey ideas about their world to audiences through artworks	MA2-GM-02 Measures and estimates lengths in metres, centimetres and millimetres	ST2-DDT-01 Uses a design process to create products to address user needs or opportunities	HS2-GEO-01 Explains how people care for Australia’s environments and participate in Australian society, using geographical information
CA3-VIS-01 Makes artworks in intentional ways to represent ideas about their world, and explains ways artists are influenced by contexts and how artworks are interpreted by audiences	MA2-2DS-01 Compares two-dimensional shapes and describes their features	ST3-DDT-01 Uses design processes to create, evaluate and modify designed solutions	HS3-GEO-01 Examines global citizenship and how people organise, protect and sustainably use the environment, using geographical information
	MA2-3DS-01 Makes and sketches models and nets of three-dimensional objects including prisms and pyramids		
	MA3-2DS-01 Investigates and classifies two-dimensional shapes, including triangles and quadrilaterals based on their properties		
	MA3-3DS-01 Visualises, sketches and constructs three-dimensional objects, including prisms and pyramids, making connections to two-dimensional representations		