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Arts and
Humanities
Research Council

Shaping Space

Key Stage Three

Exploring Architectural Models

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Workshop themes

1

The V&A and Building Centre came together in 2021 to collaborate on Shaping Space, an exhibition that explored and celebrated architectural model making. Model making has been used as a way to understand and shape the world around us - as a tool for creating new, imagined spaces and as a means of remembering places lost to us. As part of the exhibition, we invite schools, from KS2 to KS5 to develop their practice of visualising and exploring the world through architectural model making. The exhibition content has now moved online and we are delighted to make our learning resources available for schools to continue to engage with and explore the fantastic models.

Key Stage Three

Key Stage Three learners are invited to explore the multiple purposes of architectural model making: testing ideas, recording and reconstructing and flights of imagination throughout the workshop series. This cross curricular set of workshops intends to expose mathematical and scientific principles within design to deepen learners understanding of engineering principles.

Workshop series objectives:

- Learners to gain an understanding of the multiple uses of architectural models
- Learners to develop model making techniques to test their ideas and develop their creativity
- Learners to explore different materials and dexterous practices required for model making

The Shaping Space school workshop series delivers a cross curricular approach to the development of tacit and embodied skills as a way to demonstrating knowledge and understanding. To do this we have carefully considered the National Curriculum aims in the development of our workshops. Learners can be expected to cover the following aspects of their Science, Maths and Design and Technology curriculum.

Science:

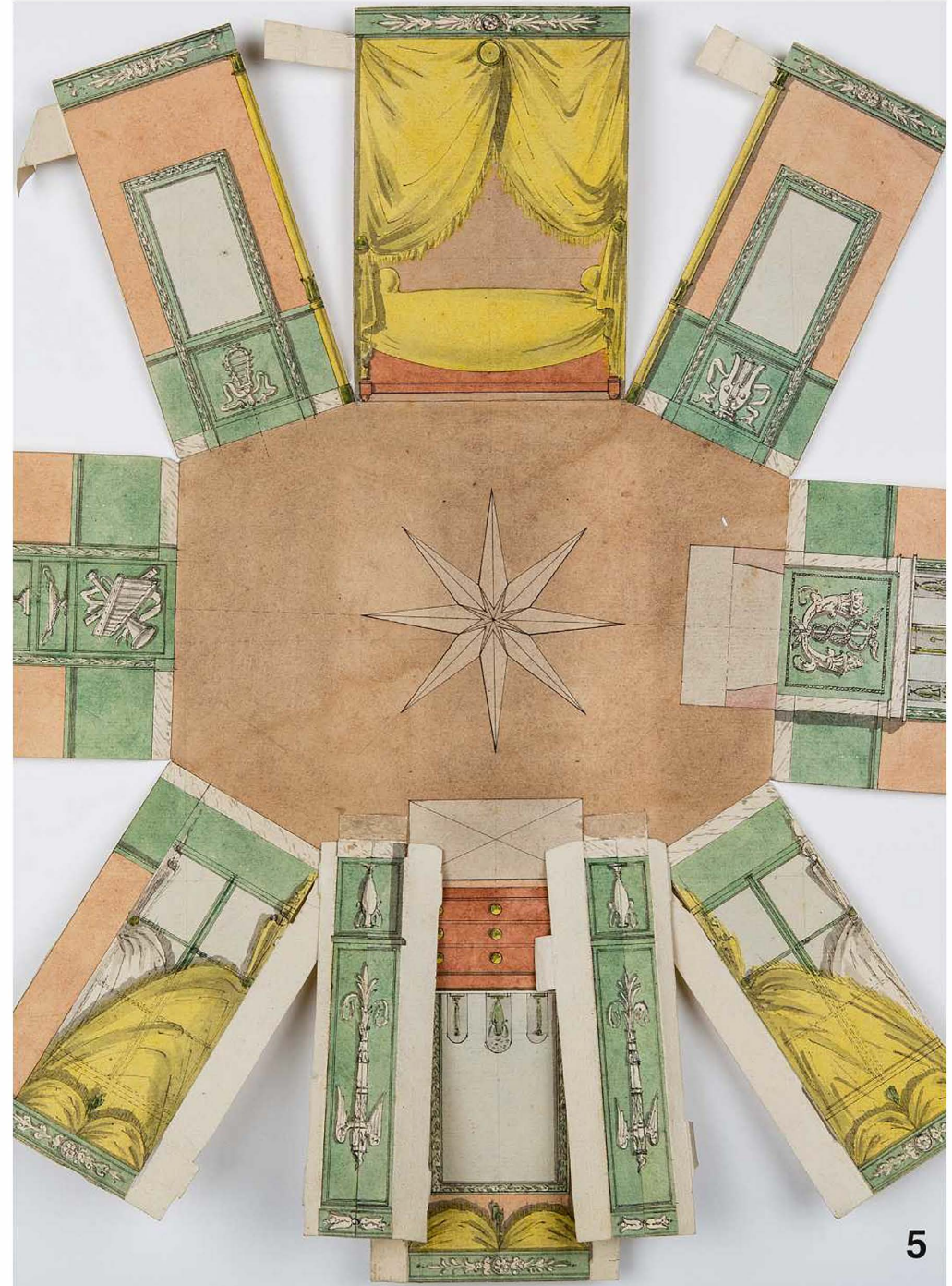
- develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics
- ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience
- select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables, where appropriate
- present reasoned explanations, including explaining data in relation to predictions and hypotheses

Maths:

- extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically
- draw and measure line segments and angles in geometric figures, including interpreting scale drawings

Design Technology:

- identify and solve their own design problems and understand how to reformulate problems given to them
- develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools
- select from and use specialist tools, techniques, processes, equipment and machinery precisely, including computer-aided manufacture
- select from and use a wider, more complex range of materials, components and ingredients, taking into account their properties
- analyse the work of past and present professionals and others to develop and broaden their understanding.



Object focused learning

3

Object based learning pedagogies are often used to encourage creative practice in the classroom. When we include objects in creative activities, we provide opportunities for learners to explore different materials, different techniques and the different forms that creative outputs take.

Encouraging learners to handle objects, to examine them in detail through touch and supported by sketching, remaking and disassembly we encourage learners to engage multiple modes of developing understanding.

Some of the skills object based learning encourages includes conceptualisation of complex concepts, reflective creative practice, and experimentation. Objects based learning can also encourage collaboration and communication skills.

When selecting objects educational professionals should consider what different materials and techniques the objects demonstrate, how the objects can link to other areas of the curriculum and how learners will be engaged with the objects. You can choose one object to study very carefully, supported by a remaking activity or a selection of objects that will allow for a wider conversation with learners.

Learners handling of objects should be encouraged, this will facilitate embodied learning experiences. Learners will develop an understanding of different materials and processes through touch, this will also encourage creative problem solving.

Workshop one - why are models made?

4

Outline

Learners to explore and experiment with creating bridge structures that can withstand high level force. Learners will be invited to recreate and test the Forth Bridge principle, discussing how forces work together to create a stable and strong structure. Learners will explore examples of fabricated tessellation on the website and make and test bridges that use the principles of tessellation.

Objectives:

- Learners will explore how architectural models are used to explore engineering principles.
- Learners will explore how they can test engineering principles with their bodies.
- Learners will explore and test the principles of tessellation in bridge building.

Learning activity testing our ideas:

Learners are to explore the three themes of the website;

- Why are models made?
- How are models made?
- Who are models made for?

Focusing on testing architectural ideas, learners will be invited to explore how we use models to prove ideas work and explore engineering principles. Using the Forth Bridge model, students will be challenged to see if they can recreate the Forth Bridge using their bodies and then create bridges of their own using the principles of tessellation in a practical activity.

Object Focus

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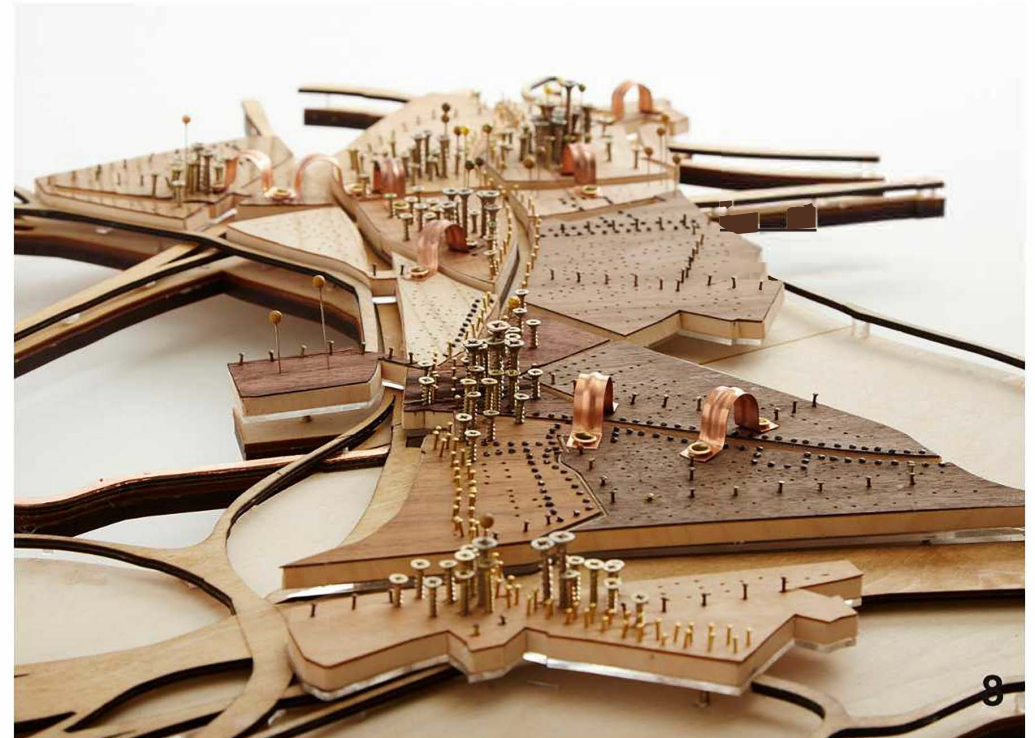
Architect Hawkins Brown developed a model for the redesign and redevelopment of Old Oak Common as part of the HS2 works in London. Historically the area is poorly connected, and the infrastructure and industry has been pushed to the city fringes.

This model represents a redesign of the infrastructure and transport links of Old Oak Common that would allow it to flourish as a community and grow economically.

The architectural model itself is unusual because of its use of commonly found construction materials, which are used to represent buildings, bridges, and trees. This model invites the viewer to consider and discuss the objects represented unusually and connect the physical world with the tools and equipment it is made with.

‘The development framework describes the transformation of an industrial archipelago into a productive mixed use place in outer London.’

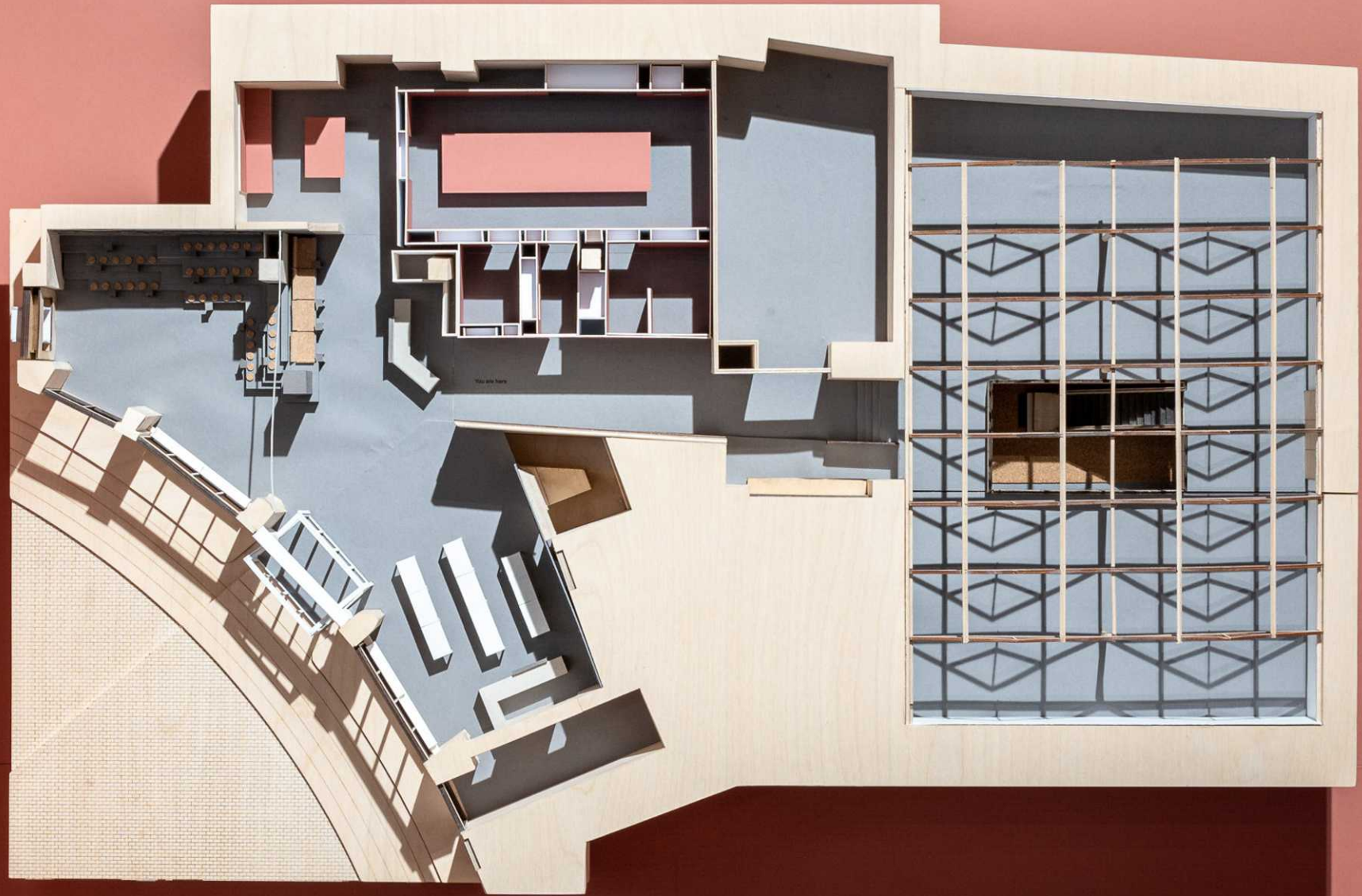
Hawkins Brown
Victoria Road and Old Oak
Lane Development Framework
Image copyright: Fred Howarth



Workshop one - lesson plan

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Time	Activity	Materials / Equipment
30 mins	Exploring the website Using the worksheet can we explore the three key themes of the online gallery: <ul style="list-style-type: none">• Why are models made?• How are models made?• Who are models made for?	Worksheet 1 Pencil
45 mins	Testing the Forth Bridge Can we recreate the Forth Bridge using our bodies? - Work together to recreate the Forth Bridge using the equipment and your bodies	Forth Bridge model kit
1 hour 30 mins	What is tessellation and how can we test it? Why do so many bridges use triangles in their structures? In pairs design and build the strongest 2D bridge structure you can.	Balsa wood Hot glue gun Pencil
15 Mins	Reflection Why are models made?	



Workshop two - how are models made?

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Outline

Architectural models come in multiple forms and are made of multiple different materials, using an array of techniques. Learners will have the opportunity to explore and test out different techniques and materials common to architectural model making.

Objectives:

- Learners to explore and experiment with different process of model making
- Learners to gain experience of working with different model making materials
- Learners to explore how to choose materials and processes based on their properties and outcomes

Learning activity:

How we make models: recreating Sydney Opera house.

Learners to work in groups of three or four to recreate a model of Sydney Opera house out of the following materials:

- Clay
- Corrugated cardboard
- Building blocks
- Polystyrene
- Paper and Card
- Cork

Learners can use commonly found tools and equipment to shape their project.

Workshop two - lesson plan

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Time	Activity	Materials / Equipment
30 Minutes	<p>Exploring the properties of materials</p> <p>Classifying and understanding modelling materials</p> <ul style="list-style-type: none"> • Sustainable / non sustainable • Malleable / non malleable • Porous / non porous • Flexible / non-flexible 	<p>Clay</p> <p>Corrugated cardboard</p> <p>Building blocks</p> <p>Polystyrene</p> <p>Paper and Card</p> <p>Cork</p>
1 hour	<p>Making your models</p> <p>Learners to, using dimensions provided, recreate a model of the Sydney Opera House using a specialist architectural model making material.</p> <p>Students to consider finish and accuracy in their making.</p>	<p>Clay</p> <p>Corrugated cardboard</p> <p>Building blocks</p> <p>Polystyrene</p> <p>Paper and Card</p> <p>Cork</p> <p>Cutting mats</p> <p>Cutting knives</p> <p>Rulers</p> <p>Scissors</p> <p>Shaping tools</p> <p>Glue guns</p>
30 mins	<p>Reflection</p> <p>Clearing up</p> <p>Analysis of material and models.</p> <p>What material was most successful?</p>	None

Dieter Cöllen is a German Architectural model maker, specialising in the recreation of ancient buildings from a traditional model making material Cork.

Cork modelling or phelloplasty is a has roots in 18th Century architectural modelling practice. Cork was often used as it is a lightweight and readily available material.

The original Temple of Bel stood until 2015 when ISIS destroyed most of the ancient city of Palmyra in Syria. The model is part of a project which aims to reconstruct in miniature the monuments lost to terrorism, based on archaeological surveys. Dieter is one of the very few experts who continue the ancient tradition of making models with cork, a material which mimics the porous surface of ancient stone buildings.

‘What I show is therefore a reconstruction or documentation of the respective building’

Dieter Cöllen
Temple of Bel
Image copyright:
Chris Jackson





Workshop three - who are models made for? 10

Outline

Architectural models have multiple uses; they can represent buildings that will be built, testing designs to ensure success, take flights of fancy or memorialise buildings and areas that are no longer in existence. Learners will have the opportunity to explore the role of models for memorialising historical sites.

Objectives:

- Learners to reflect on the multiple uses of architectural model making and consider the wider purpose models have
- Learners to consider how architectural models invite the viewer and the maker to explore their world and histories
- Learners to use skills in model making to recreate historical buildings

Learning Activity: who are models made for?

Recreating Euston Arch: built in 1837 and designed by architect Phillip Hardwick, the arch was demolished in 1962. Euston Arch was the original entrance for Euston Station and a London landmark inspired by Roman architecture.

Learners to recreate Euston Arch from historical references, pictures, and plans.

Workshop three - lesson plan

11

Time	Activity	Materials / Equipment
45 mins	Research Task: Euston Arch How can we use historical references, images and plans to decide on appropriate materials and dimension for making a replica model.	Research sheets Pen / pencil Paper
1 hour 30 mins	Remaking Euston Arch Learners to remake Euston Arch to the scale of 1:20 based on their research. Learners will be invited to select the material they feel is most suitable for the making of the model based on previous learning and understanding and to replicate original architecture.	Clay Corrugated cardboard Building blocks Polystyrene Paper and Card Cork Cutting mats Cutting knives Rulers Scissors Shaping tools Glue guns
15 mins	Reflection Review of models, casts and bioplastics and reflection of learning over the three workshops.	None



With thanks to



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