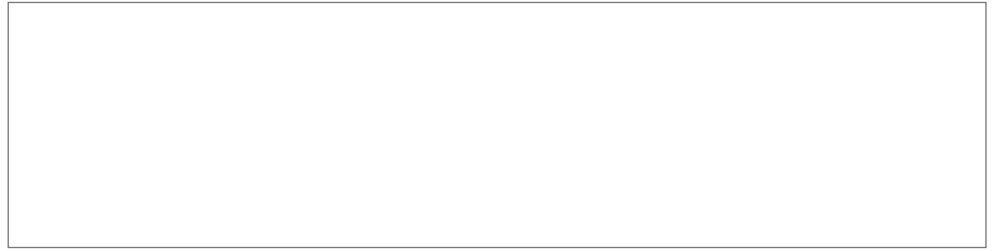


# MODEL SCHOOL



## 2

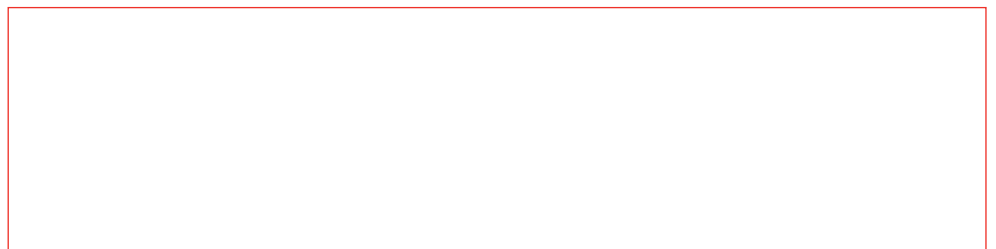
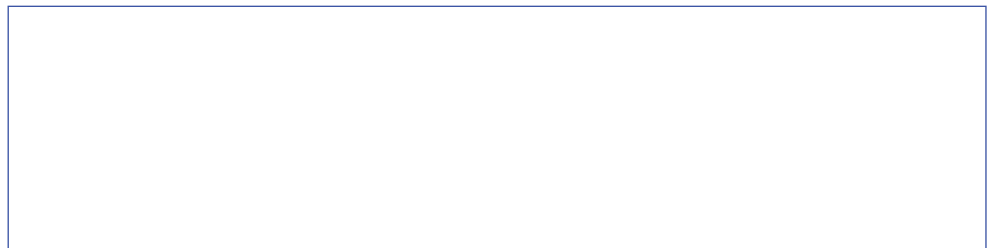
### Elements of Architecture

Lesson Plans:

2.1 Cardboard towers

2.2 Spaghetti towers

2.3 A home for the penguin, pada and pig



# Model School

## 2. Elements of Architecture



### Stage 2 Outline.

This part of the project provides the class with small building blocks of knowledge which will help them to work on their own in the latter stages. The first two lessons are highly interactive, pupils will test the things they have made to destruction, (the children will love it). Working in small groups, sharing knowledge and experience provides confidence in 3D work and understanding implications of making decisions.

- Lesson 2.1      Cardboard Towers**  
This introduces the class to basic forms of construction and challenges the pupils to make a model of a tower of their own design which is tested to see if it can support weights.
- Lesson 2.2      Spaghetti Towers**  
This introduces another simple type of construction - the frame. Like Lesson 2.1, the children build their own towers and test the strength of their designs with weights.
- Lesson 2.3      A Home for the Penguin, Panda and Pig**  
This sessions looks at other elements of architecture, the shape of spaces, doors, windows, and materials through designing homes for animals.

#### Interesting reading books

Any one of these by this author, Richardson, Phyllis

**XS: Big Ideas, Small Buildings,** 2001. London: Thames and Hudson Ltd.

**XS: Green: Big Ideas, Small Buildings,** 2007. London: Thames and Hudson Ltd.

**XS: Small Structures, Green Buildings,** 2007. London: Thames and Hudson Ltd.

**XS: Extreme: Big Ideas, Small Buildings,** 2009. London: Thames and Hudson Ltd.

# Model School

## 2. Elements of Architecture

### Lesson Plan 2.1

### Cardboard Towers

<b>Location</b>	Classroom
<b>Suggested Duration</b>	45 mins (approx)
<b>Task type</b>	3D creative, working in groups.
<b>Materials /Equipment</b>	Cardboards sheets, recycled cardboard, glue, sellotape. Old books or wooden blocks to be used as weights.
<b>Learning intentions</b>	To understand a material and its properties in order to build a stable structure
<b>Record Of Learning Activity</b>	Finished models and photos.
Introduction	Open the class with the these suggested questions:
Questioning	<ul style="list-style-type: none"> <li>• How do buildings stand up?</li> <li>• Where does the weight of the roof go?</li> <li>• Where does the weight of the floor, and all the things on it go?</li> <li>• Show images of architecture with 'load bearing walls'</li> <li>• Generate a discussion on what buildings are made from - bricks, stone, glass, steel, concrete, wood. Which do they think is the strongest?</li> <li>• Look around. How many different types of material are used in the classroom?</li> </ul>
Main Activities	Organise the class into small groups of 4/5. Challenge them to build a tower out of cardboard, they should try and make it as tall and as possible. Intuitively the children should be able to come up with some fairly robust designs for their towers. You could at this point ask them to draw a picture of the finished design in their project book or on a piece of paper. It will be a record of the works so far. Once all the towers are completed, display them all in one place, ask each group to talk about what they did. Now you can test each one to see how much weight it can take before it collapses, the one that can take the most without collapsing is the winner. This should be fun and very exciting! Take photographs or a video of the proceedings if you can.
Making	
*NOTE: younger pupils may struggle with cutting thicker card. Thin card or pre-cut components of corrugated card are suggested if this is the case.	
Closing the Lesson	The class should be able to tell you why some stood up to more weight than others. Ones with thicker walls are likely to be stronger, tall thin walls are likely to have collapsed quicker. Towers with lots of internal walls are also likely to be stronger as they have strength from area to spread the load. Discussions can relate back to observations during any building visits or images that have been shown to the class.
Testing	

# Model School

## 2. Elements of Architecture

### Lesson Plan 2.2

### Spaghetti Towers

<b>Location</b>	Classroom
<b>Suggested Duration</b>	45 mins (approx)
<b>Task type</b>	3D creative, working in Groups
<b>Materials /Equipment</b>	Spaghetti and jelly babies! Old books or wooden blocks.
<b>Learning intentions</b>	To understand a material and its properties in order to build a stable structure
<b>Record Of Learning Activity</b>	Drawings, finished models and photos.
<b>Introduction</b>	This follows directly on from lesson 2.1 Cardboard Towers
<b>Discussing</b>	Show images of architecture with 'framed buildings' Reintroduce the discussion on what buildings are made from - bricks, stone, glass, steel, concrete, wood. The class could refer back to the data collection sheets used in Lesson 1.3.
<b>Main Activities</b>	Organise the class into small groups of 4/5. Challenge them to build framed tower out of the spaghetti and jelly babies, making it as tall as possible. Intuitively the children should be able to come up with some fairly robust designs for their towers.
<b>Making</b>	You could at this point ask them to draw a picture of the finished design in their project book or on a piece of paper. It will be a record of the works so far. Once all the towers are completed, display them all in one place, ask each group to talk about what they did. Now you can test each one to see how much weight it can take before it collapses, the one that can take the most without collapsing is the winner. This should be fun and very exciting! Take photographs of the proceedings if you can.
<b>Closing the Lesson</b>	The class should be able to tell you why some stood up to more weight than others.
<b>Investigating</b>	The ones with lots of diagonals or 'cross bracing' should be strongest. Look around the classroom and the school? Can you tell if it is made from a 'frame' or load bearing walls? If there are lots of columns it is likely to be a framed building. Discussions can relate back to observations during any building visits or images that have been shown to the class.

### Lesson Plan 2.3

### A Room for Panda, Pig and Penguin

<b>Location</b>	Classroom
<b>Suggested Duration</b>	1.5 hours (approx)
<b>Task type</b>	3D creative, working in Groups
<b>Materials /Equipment</b>	Plasticine, card drinking straws, lolly sticks and sugar cubes, runny honey & glue.
<b>Learning intentions</b>	To be able to design a room that spatially and ergonomically considered
<b>Record Of Learning Activity</b>	Drawings, finished models and photos.
Introduction	Use the information provided in this section of the pack to generate a discussion about the different materials buildings are made from. Move on to discuss the shapes of spaces and what these are like to be inside, and doors and windows. How do we get in? How do we look out? Look around the classroom, what shape is it? Where is the door? Is it smaller than the door at the front of the building? How big or high are the windows to look out of? What is the view like?
Discussing + Questioning	There are three friends: Panda, Pig and Penguin. The challenge is to design a 'classroom' for one of them.
Main Activities	Organise the class into groups 2-3 children. For each group allocate or give them a choice of animal and the associated material listed below,
Making	<ol style="list-style-type: none"> <li>1. <b>Mr Panda</b> - plasticine, card, drinking straws, glue</li> <li>2. <b>Mr Pig</b> - plasticine, card, lolly sticks , glue</li> <li>3. <b>Mrs Penguin</b> - plasticine, card, sugar cubes and runny honey for glue</li> </ol> <p>Each group is to make a plasticine model of their animal, and then build a room for their animal from the materials they have been given. They should also try to build a simple shape - a circular, rectangular, or a square home. They should think about including a door and a window. Restrict the children to making their models on a base of A4 card so that it can be easily moved.</p>
Closing the Lesson	Gather all the creations together and discuss with the class. Ask them to imagine if the wolf would like the homes they have made. Models should be kept safe for use in future activities.
Showing	



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# Model School

## Stage 2 Evaluation.

<b>Assessment</b> Exercises 2.1, 2.2, 2.3 (sheet 1 of 2)	<b>EXPRESSIVE ARTS</b> <i>I can respond to the work of artists and designers by discussing my thoughts and feelings. I can give and accept constructive comment on my own and others' work.</i>	<i>I can create and present work that shows developing skill in using the visual elements and concepts.</i>	<i>I can develop and communicate my ideas, demonstrating imagination and presenting at least one possible solution to a design problem.</i>	<b>HEALTH AND WELLBEING</b> <i>While working with others, I improve my range of skills, demonstrate tactics and achieve identified goals.</i>	<b>LANGUAGES</b> <i>When I engage with others, I can respond in ways appropriate to my role, show that I value others' contributions and use these to build on thinking.</i>	<i>I can recognise how the features of spoken language can help in communication, and I can use what I learn. I can recognise different features of my own and others' spoken language.</i>
Pupils Name	EXA 1 / 2-07a	EXA 2-03a	EXA 2-06a	HWB 2-23a.	LIT 2-02a	ENG 2-03a



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# Model School

## Stage 2 Evaluation.

<p><b>Assessment Exercises</b> 2.1, 2.2, 2.3 (sheet 2 of 2)</p>	<p><b>MATHEMATICS</b> <i>Having explored a range of 3D objects and 2D shapes, I can use mathematical language to describe their properties, and through investigation can discuss where and why particular shapes are used in the environment.</i></p>	<p><b>SCIENCES</b> <i>By considering examples where energy is conserved, I can identify the energy source, how it is transferred and ways of reducing wasted energy.</i></p>	<p><b>SOCIAL STUDIES</b> <i>Having explored my local area, I can present information on different places to live, work and relax and interesting places to visit.</i></p>	<p><b>TECHNOLOGY</b> <i>Through discovery and imagination, I can develop and use problem solving strategies to construct models.</i></p>	<p><i>Having evaluated my work, I can adapt and improve, where appropriate, through trial and error or by using feedback.</i></p>	<p><i>By applying my knowledge and skills of science and mathematics, I can engineer 3D objects which demonstrate strengthening, energy transfer and movement.</i></p>
<p><b>Pupils Name</b></p>	MTH 2-16a	SCN 2-04a	SOC 2-10a	TCH 1 / 2-14a	TCH 1 / 2-14b	TCH 2-12a



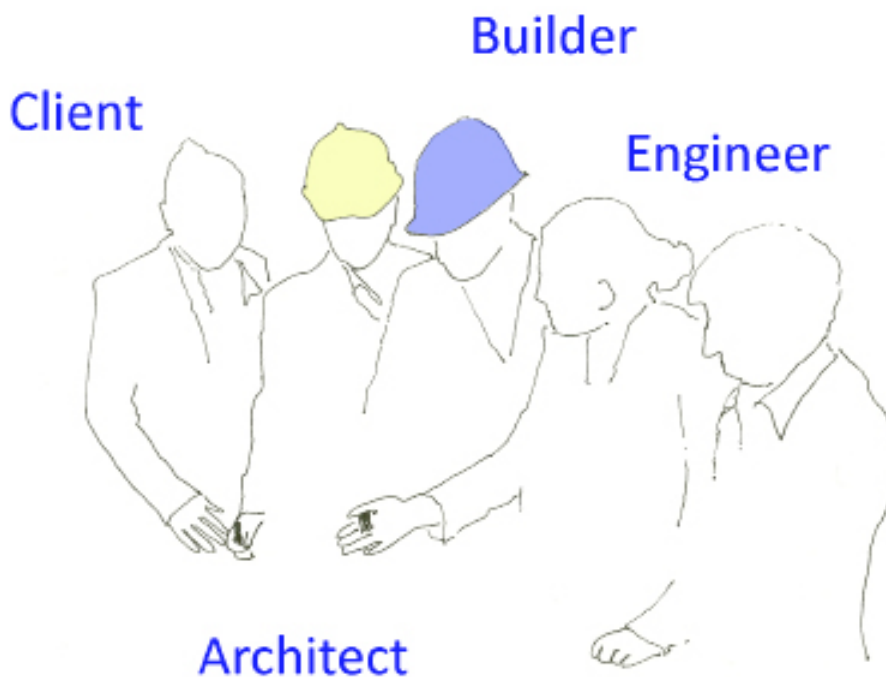
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## 2. Elements of Architecture

### INFORMATION SHEET

# Who makes architecture?



# YOU!

Architects always work in teams to design and build buildings. Lots of people are involved. Can you tell what each person does?



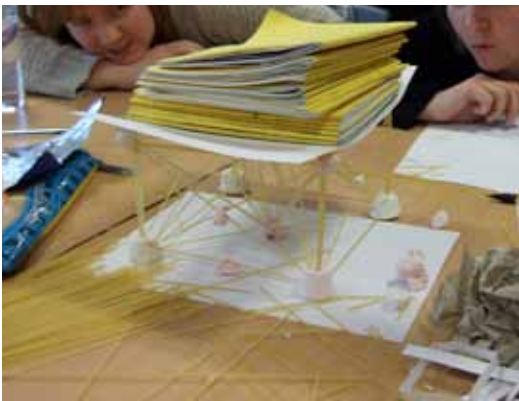
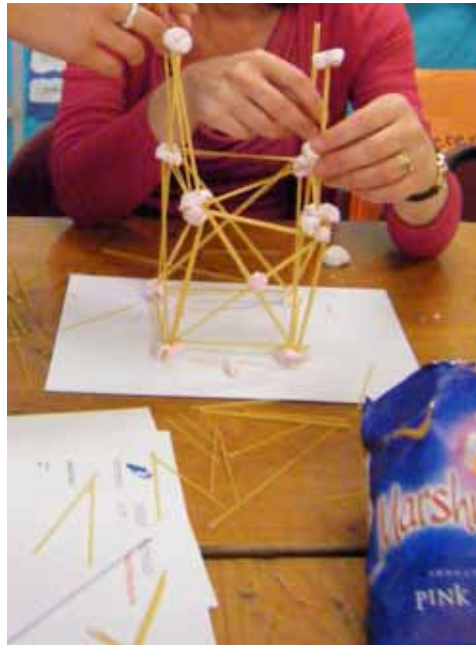
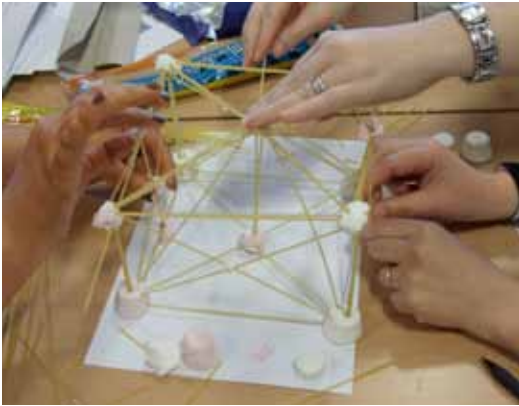


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## 2. Elements of Architecture

### INFORMATION SHEET



Spaghetti Tower



Cardboard Tower



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### INFORMATION SHEET



House for a Polar Bear



House for a Penguin



House for a Panda



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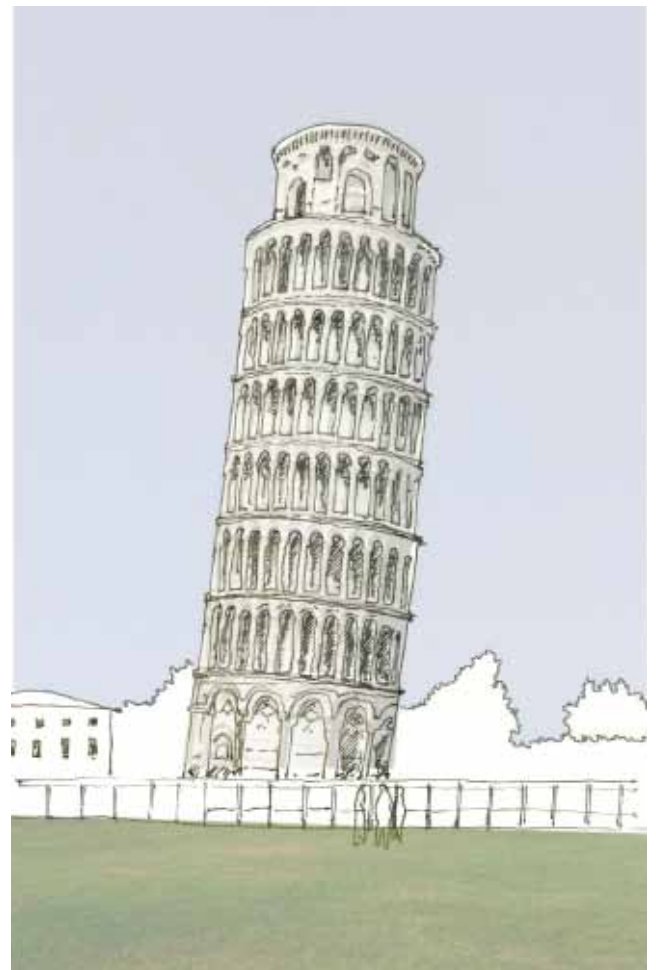
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## 2. Elements of Architecture

### INFORMATION SHEET



Eiffel Tower - steel frame structure.  
*Real life 'Spaghetti Tower'*



Tower of Pisa - Load-bearing stone structure.  
*Real life 'Cardboard Tower'*



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### INFORMATION SHEET



#### **Scottish Blackhouse**

Load-bearing stone.



#### **New York Sky Scraper**

Steel Frame Structure, clad in stone, steel and glass.



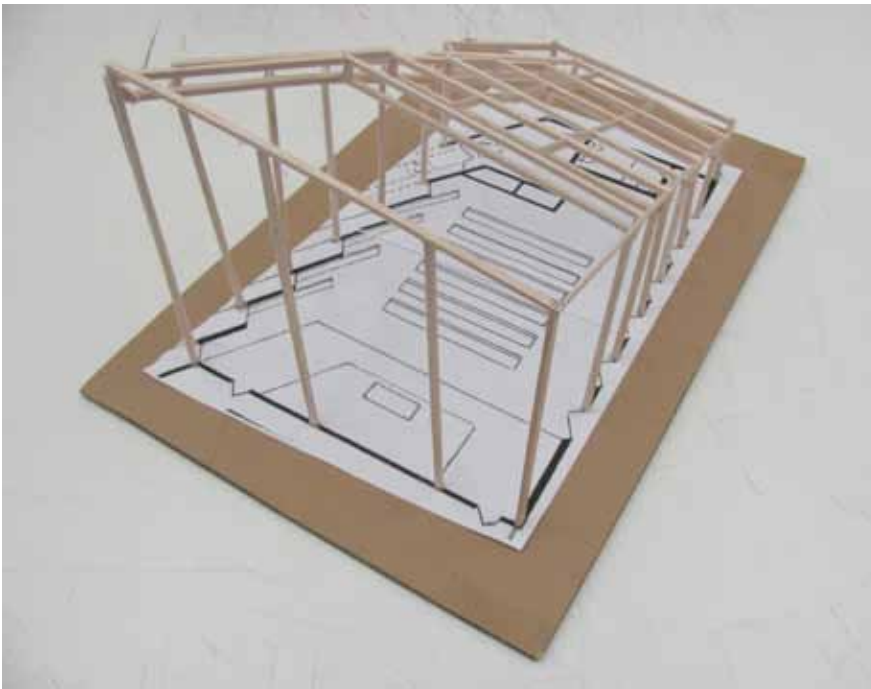


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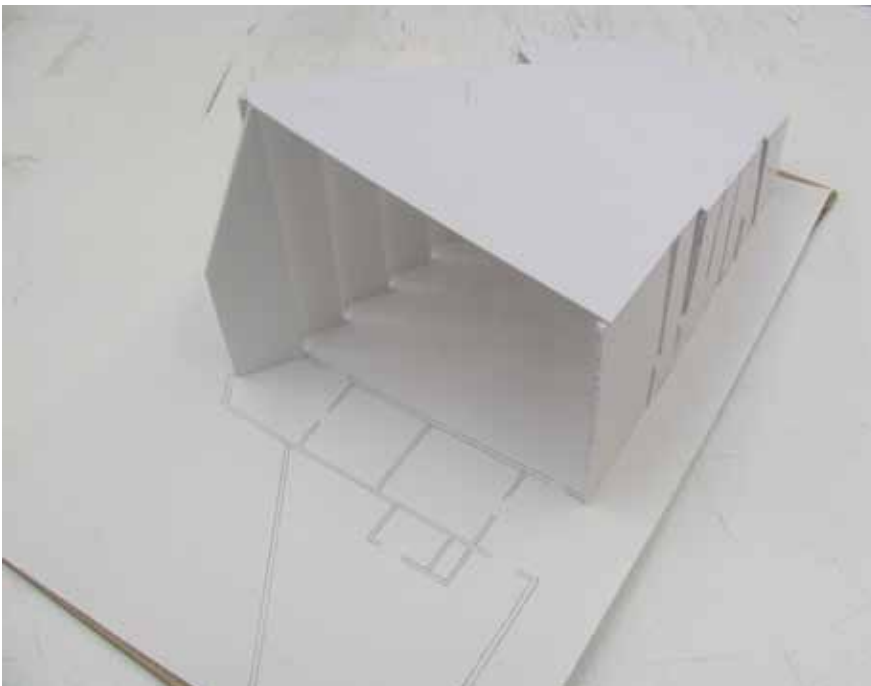
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### 2. Elements of Architecture

#### INFORMATION SHEET



Architectural model using a frame structure



Architectural model using solid walls



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### INFORMATION SHEET

### BUILDING MATERIALS



TIMBER



BRICK



STONE



COPPER



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### INFORMATION SHEET

### BUILDING MATERIALS



GLASS



CONCRETE



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### INFORMATION SHEET

## BUILDING MATERIALS



STEEL

*WHAT OTHER BUILDING MATERIALS CAN YOU THINK OF?*