

Building Structures

Unit 2

Teacher's Notes

Finding Out About Cantilever Structures

Main Objectives

- Finding out about cantilever structures
- Using a crank and pulley system
- Learning construction skills

Cross-Curricular Objectives

Math

- Calculating the load acting on a cantilever structure
- Calculating the distribution of the load on a structure
- Finding out how well a structure resists forces
- Calculating revolutions in a pulley system

Science

- Learning the principle of cantilever structures
- Finding out about the load bearing properties of materials

Technology

- Applying problem solving skills
- Learning construction techniques using square-section wood
- Learning how to construct cantilever structures
- Finding out how to construct a pulley system

Language Arts

- Developing effective communication skills in a variety of settings including group activities

- Making and listening to oral presentations and reports
- Demonstrating comprehension of nonfiction
- Demonstrating comprehension of information resources to research a topic
- Writing for a variety of purposes: to describe, to inform, to entertain, and to explain

Social Science and History

- Learning about technological developments to utilize natural resources in order to satisfy basic human needs
- Describing the effect of geography on shelter, clothing, and other aspects of culture
- Investigating the development of road systems
- Inferring from archeological evidence the characteristics of early structures

Materials for Unit 2

wood glue	square-section wood 5mm dowel
modeling clay	card
transparent tape	plastic straws
card corner pieces	paper clips
MDF wheel - medium size	small screw eyelets
MDF wheel - small size	sandpaper
1 cm wide strips of card	thread or fishing line
soft wire	

Tools & Equipment for Unit 2

junior hacksaws	bench hooks
scissors	Lynx Jointer
weighing scales	glue spreaders
safety glasses	tape measure
ruler	pencil
hand drill	vice
small hammer	pair of pliers
bulldog clip (optional)	5mm drill bit

Portfolio

It is important for all pupils to keep a record of what they have done, how they solved problems, how well they worked within a team, and what they have learned. This is best achieved when pupils keep a diary of their activities in a portfolio.

The portfolio is designed to support the learning objectives stated at the start of the units. Pupils should write down what they have learned and understood from this unit of work. Encourage pupils to use drawings, photographs, and written responses when completing the portfolio.

Unit 2 Evaluation

On completion of this unit students should know:

- How cantilever structures work
- How to construct a crank and axle mechanism
- How a structure resists forces
- How to work from technical instructions
- How to make straws into strong structures
- How to apply problem solving skills to learn about structures
- How to build structures using wood.

Vocabulary for Unit 2

cantilever	crank	area
span	pulley	dowel
pliers	resist	pier
balance	jointer	drill
equilibrium	jib	arm
vertical	structure	rectangular
counterbalance	eyelet	mechanism
technique	flexible	base
system	load	uprights
crane	overlap	horizontal
axle	load-bearing	frame
force	counterweight	effort