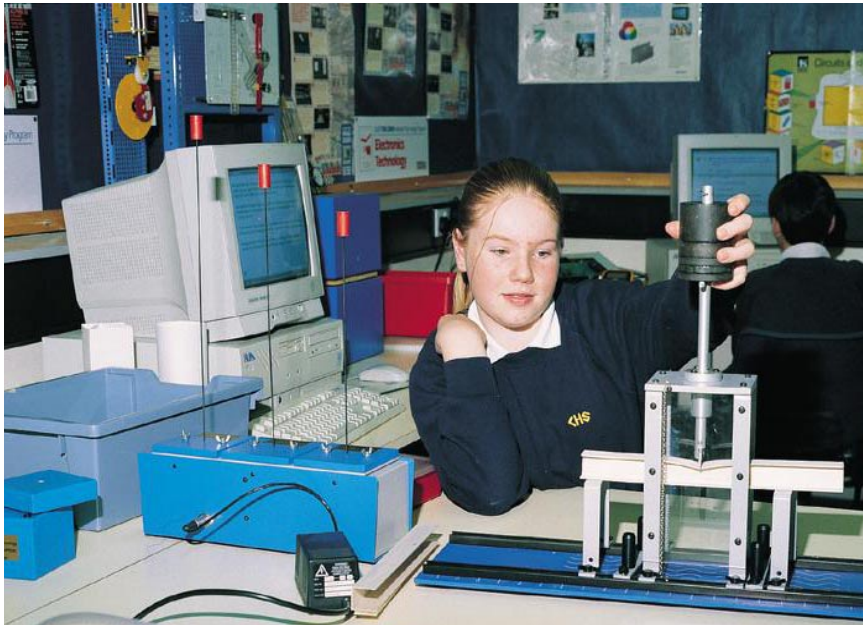




Construction Technology Projects



An exciting resource designed to offer practical investigation into the world of construction technology. The Construction Technology Projects allow students to design, make and test structures. They research construction projects and the services they include. Students use architectural CAD to discover design principles and develop their design solutions. Simulation equipment is used to study the effect earthquakes have on different skyscraper design.

The Construction Technology Projects are available as four topics – Materials and Structures, Architectural Drawings, Superstructures and Services.

The implementation of this resource can be a single workstation through to multiple workstations with individual student tasks and whole-class demonstrations.

If used in conjunction with our ClassAct management system, tracking of student question responses and report generation is achieved.

The curriculum incorporates continuous assessment through questions and workbook entry.

Every assignment starts with an inventory check to ensure the students have all that is required and that any missing items are identified before commencing the activity.

Each assignment is divided into a series of tasks. Hands-on tasks form the core of the student work. Where appropriate, these are accompanied by research tasks based upon illustrated Fact files and on-screen applications.

Topic areas include:

Materials and Structures

- Materials
- Strength of simple 3D structures
- Torsion, tension, shearing and compression forces
- Strengths of different types of beams
- Bridge construction and testing
- Construction products
- Tensile strength
- Material classes
- Properties of wood, steel and concrete construction materials
- Beam technology
- Construction foundations
- Bridges

Architectural Drawings

- Architectural drawings and scales
- Architectural CAD
- Construction site preparation
- Surveying and contour maps

Superstructures

- Advanced construction techniques
- Dynamic forces
- Tunnelling technology
- Earthquake simulation to test skyscraper models
- Skyscraper design and testing

Services

- Job investigation
- Resources for construction
- Water and waste systems
- Electrical systems
- Computers in construction
- Heat transfer and insulation
- Thermal insulation

Activities include:

- Materials and Structures
- Explore the meaning of technology, particularly in relation to construction.
- Investigate simple structures.
- Identify the importance of shapes in structures.
- Construct different pillars to investigate how shape affects strength.
- Learn about different structural units.
- Learn about forces that affect structures.
- Research properties of different materials.
- Evaluate the strength of different types of beam.
- Test beam strength with a materials tester.
- Construct a model beam bridge.
- Apply a load to the beam bridge to measure its strength.
- Learn about different types of bridge structure.
- Build a model suspension bridge.
- Apply a load to the model suspension bridge and observe the results.
- Compare strength of the beam bridge with the strength of the suspension bridge.
- Determine material properties from tensile test data.
- Interpret a graph of strength versus carbon content of steel.
- Identify material properties and how they affect use.
- Recognise how the properties of wood affect its use in construction.
- Distinguish between various wood products used in construction.
- Investigate the properties of concrete and examine it as a construction material.
- Determine how concrete can be reinforced.
- Recognise the important factors of beam design. Design a beam according to specific criteria.
- Test the load bearing capacity of foundation samples. Investigate the basic principles of foundations. Recognise how soil conditions impact on foundation qualities.
- Investigate the technology of roof trusses.
- Recognise important features of truss bridges.
- Evaluate a structural test carried out on a truss bridge.
- Investigate modern bridge technology.



Construction Technology Projects

Activities Continued:

Architectural Drawings

- Use an architect's scale to investigate construction drawings. Explore the wide range of drawings required to build a structure.
- Demonstrate an understanding of scale. Use CAD software to draw an outline plan of a building.
- Use layers to draw a residential layout plan in CAD.
- Recognise the importance of landscaping as a final stage of a construction project.
- Recognise the importance of following a specification when designing new structures.
- Design and layout a structure to fulfill the demands of a client.

Superstructures

- Use an Earthquake Simulator to test different types of structures.
- Build model skyscrapers and test them on the Earthquake Simulator.
- Compare wall and frame construction. Identify types of residential construction methods. Recognize the benefits of geodesic dome construction.
- Recognise simple construction techniques. Evaluate the suitability of modular construction. Identify advanced construction techniques.
- Investigate the effect of dynamic forces on structures.
- Identify how buildings can be designed to resist dynamic forces.
- Determine the factors important in tunnel construction.
- Evaluate how new technology and materials are used in tunnel construction.

Services

- Define construction technology.
- Recognise the roles of various personnel within the construction industry.
- Recognise the stages involved in site preparation. Identify uses for construction machinery.
- Interpret a contour map to produce a cross-section of a construction site. Calculate construction preparation costs.
- Investigate materials and techniques used in residential plumbing.
- Explore residential electrical systems.
- Recognise electrical hazards and the importance of safety in a residential electrical system.
- Determine the correct wire gauge for circuits in a residential electrical system.
- Recognise the key applications of computers in construction technology.
- Plot a graph to chart the progress of a construction project using bar charts.
- Investigate construction project management.
- Identify insulation as a desired property of construction materials.
- Use a Thermal Chamber to investigate insulation properties of single and double glazing.
- Evaluate the energy and economic characteristics of residential double-glazing.
- Determine the basic components of a climate control system.

Items supplied with the Construction Projects include:

ST120A Materials and Structures

- Materials Tester
- Bridge Construction Base
- Student Assignment Guide
- Student Workbook
- Instructor's Guide
- Construction Projects Software
- Set of Masses
- Fact files: Strength and Structures, Forces.
- Accessories
- Consumables

ST120B Architectural Drawings

- Student Assignment Guide
- Student Workbook
- Instructor's Guide
- Construction Projects Software
- 3D Floorplan CAD Software
- Architect's Scale
- Residential / Road Plans

ST120C Superstructures

- Earthquake Simulator
- DVD: 'Introducing Eurotunnel'
- Student Assignment Guide
- Student Workbook
- Instructor's Guide
- Construction Projects Software
- Skyscraper Simulators
- Book: 'The Official Channel Tunnel Fact File'
- Accessories

ST120D Services

- Thermal Chamber Testing Kit and Stopwatch
- Student Assignment Guide
- Student Workbook
- Instructor's Guide
- Construction Projects Software

Additional items required:

- Computer
- Access to DVD player (for Superstructures only)

Order as:

ST120A Materials and Structures

ST120B Architectural Drawings

ST120C Superstructures

ST120D Services

Contact LJ Create for more information on implementation.

	No.	Average time
ST120A Lessons	16	60 minutes
ST120B Lessons	6	60 minutes
ST120C Lessons	6	60 minutes
ST120D Lessons	10	60 minutes
Total		38 hours