Teacher Resource Pack 3: Super Superstructures!

Teachers' notes

Introduction

Superstrcuture is a resource pack developed by Abertay University for the Royal Academy of Engineering (RAE) Ingenious Project: *On the right track: education and engineering for all*.

The aim of the RAE Ingenious project is to encourage interest in engineering and uses the backdrop of the Dundee Waterfront regeneration as a basis.

Using the backdrop of the new Dundee railway station and plaza, this worksheet will explore the concept of superstructures.

Contents

This pack provides material for curriculum for excellence first and second levels and comprises:

- Teacher's booklet which includes:
  - Teachers notes
  - Curriculum links
  - Activity
- Presentation
- Activity card

Presentation & Activity: Understanding Bridges

Subject: Art & Design |Craft, Design, Engineering and Graphics

Aim: Develop understanding of the built environment and infrastructure. Develop 3D model building skills.

Resources: Information Card & PowerPoint presentation.

Curriculum references:

EXA 1-06a, EXA 2-06a, TCH 1-09a, TCH 2-09a, TCH 1-12a, TCH 2-12a

Key vocabulary: Civil engineering, engineer, construction, deconstruction, reuse, recycle, sustainable.

What you will need: Paper plates, A4 paper paperclips, ruler or measuring tape and toy helicopter (or wooden block).

Notes

The activity is to construct a freestanding helicopter tower (helipad) using the materials available.

Delivering the Activity

The activity should be delivered in small groups (4-8 children). The Superstructures presentation should be delivered prior to the activity and the Activity Card should be available during the activity.

Aim: Each group should design and build a tower with a helicopter landing platform (helipad) on the top.

Rules:

- The base of the tower must not be attached to the floor or the table in any way
- The tower must be as tall as possible
- The helipad must be horizontal and capable of supporting the helicopter
- The tower must be stable (must not fall over) without the weight
- The tower must be stable (must not fall over) with the weight
- The helicopter must not be attached to the helipad in any way

The activity duration is normally 15-20 minutes and the time taken for each of the groups to construct their helipad can be timed if competition is required. Points can also be awarded for complexity of design.

Figure 1. Working with the materials to decide upon the design of the helipad.

Figure 2. Simple helipad base and pad (plate).

Figure 3. testing the superstructure; applying load (giant Jenga block) to the helipad.

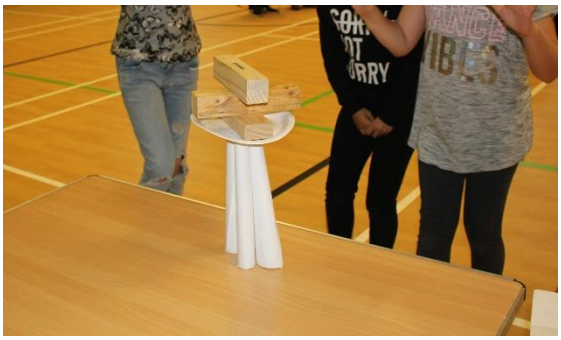

Figure 4. Simple design delivering sound load capacity.