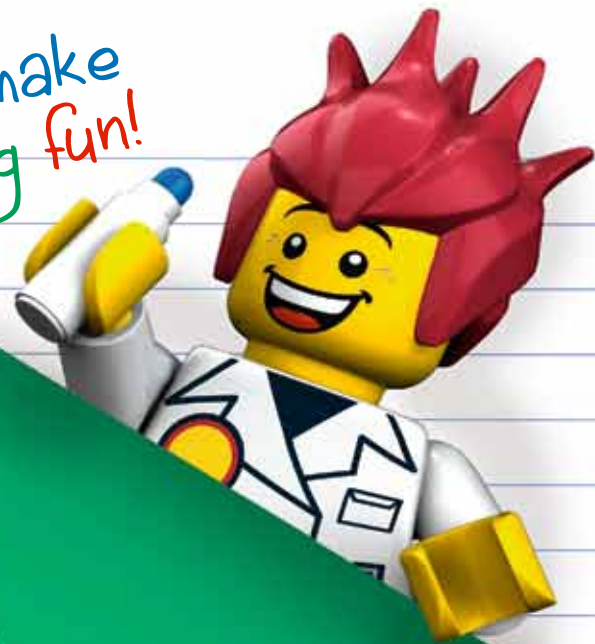


Let's make learning fun!



**education**  
EXPERIENCES

This book belongs to: **Teacher**

Class: **Tall Towers**

## Education Objectives

The objectives of this programme are to give your group the opportunity to:

- Learn about structures such as houses and towers.
- Learn how to increase the stability of tall structures through Hands On experiments and experience in a workshop.
- Relate Hands On activities to the experience of the attractions in LEGOLAND® Windsor.

Different activities are built into the programme to enable pupils to work at their own pace and according to their individual needs.

Although rides and attractions cannot be reserved, your school party is encouraged to enjoy the Eyes On and Body On activities before and/or after the workshop. There are some height restrictions on the rides so it is advisable to check these before you visit. If your group has special needs requirements there is a guide available that will help you make the most of your visit.

## National Curriculum Mapping

This resource corresponds to the following areas of the National Curriculum:

### KS1

**Design & Technology** KS1: 1a, b, c, d, e; 3a

**Science** KS1: Sc1-2a, b, c, h, i, j

### KS2

**Design & Technology** KS2: 3a, b, c

**Science** KS2: Sc1-2b, i, j, k, l



Dear Class,

We have a team that designs new rides and buildings for LEGOLAND® Parks, not just here in Windsor, but all over the world.

Yesterday I heard that you are all coming on a school trip to LEGOLAND Windsor. The design team are very glad because we are sure that you can help us with a problem.

You see, we need to design some new buildings for a brand new LEGOLAND Park. We are already making drawings of the things that are going to be in the Park. One of them is a tall tower. The idea is that visitors can go to the top of the tower and get a beautiful view of the whole Park, but we have a problem and that is why they need your help.

At the new LEGOLAND Park there is always a risk of earthquakes. You probably know that when there is an earthquake, houses shake and tremble - some even fall over. We don't want that to happen to our tower!

So, when you come to LEGOLAND Windsor, will you help build some LEGO® towers, which won't fall over when the ground shakes?

We would be really pleased if you can help!

See you soon

Professor Albrick!

Prof Albrick  
Dept. LEGOLAND Learning  
LEGOLAND Windsor



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# Structures

This information is designed to give you a quick overview of the concept of structures and to provide you with ideas for answers for the Eyes On and Body On activities.

## Structures can be used for:

- supporting a load - chair
- spanning a gap - a bridge.

Such structures are called frame structures.



## Or they may be used for:

- enclosing objects or people - milk cartons, cars, houses.

These are called shell structures.



## Structures may be referred to as:

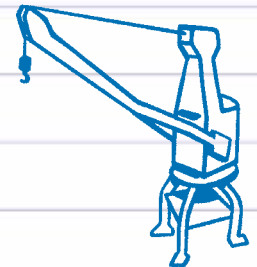
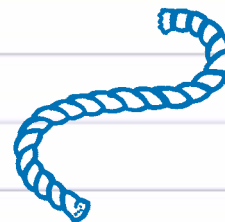
- man-made structures - houses, chairs, towers, cars, cranes, etc.
- natural structures - leaves, spiders' webs, human or animal skeletons, snail or turtle shells.



## Man-made structures may be subdivided into:

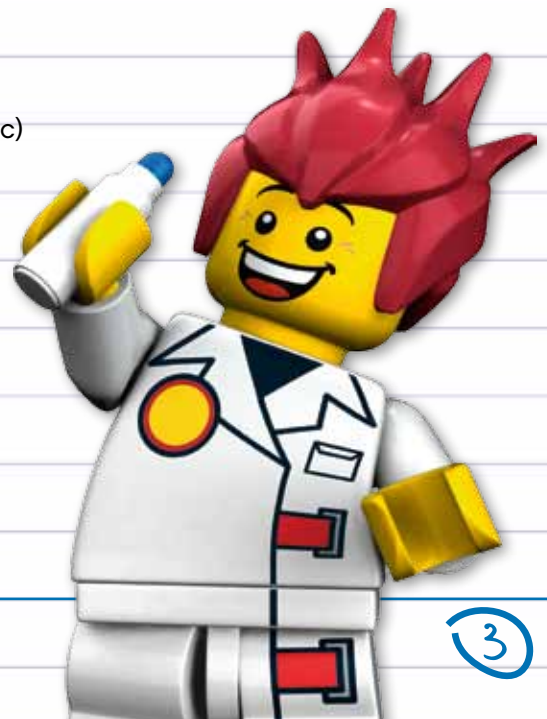
- bendy structures - rope, folding doors, plastic bags, etc.
- rigid structures - a crane, a house, a chair, etc.

A structure should be designed for its intended purpose. It may need to be stable, strong or bendy.



## In designing a structure certain factors have to be considered:

- the material used (elasticity, rigidity, strength, etc)
- the shape of the structure (width, height, length, etc)
- the pattern of the structure (triangles, arches, brick patterns, etc)
- the weight distribution of the structure
- the forces acting upon the structure (water, wind, static or dynamic loads).





## Tall Towers Workshop

A 45-minute workshop helps pupils to understand that the stability of a tower made from a LEGO® Education kit such as LEGO Basic Bricks is affected by the size of its base, and the way that the bricks overlap and are pressed together. Pupils build towers and test them on an earthquake table.

For further information on LEGO Education products **tel: 01761 239 267** or visit the web site at [www.LEGO.co.uk/education](http://www.LEGO.co.uk/education)



## Fairy Tale Brook

A boat ride through magical fairy tale settings, which show many different structures.



## Miniland

A miniature wonderland containing an almost unlimited number of buildings, bridges and other structures to look at.



## DUPLO™ Land

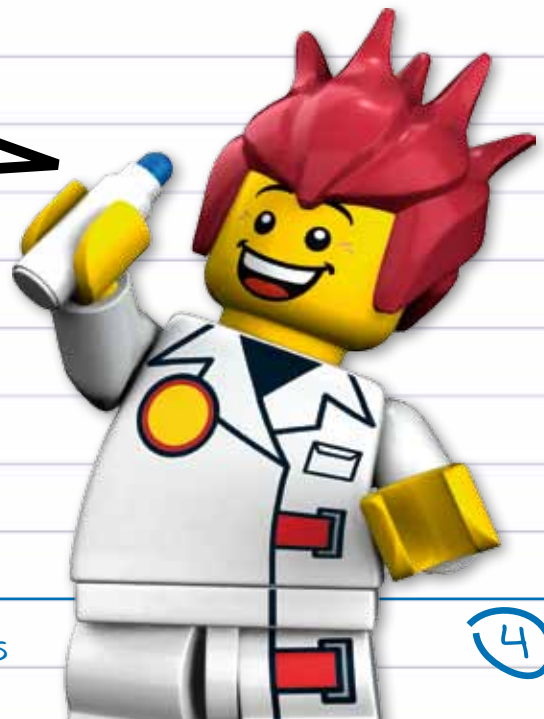
A playscape where pupils can scramble through and over bridges, ladders, slides and other exciting structures.



## Pirate Training Camp

An attraction with net climbs, slides, cables and suspension bridges and other exciting structures.

170,000 LEGO bricks were used to create the 1:50 scale replica of 30 St. Mary Axe (The Gherkin) and the model stands at 4 metres tall.





## Activities before the visit

- Show your pupils the map of LEGOLAND Windsor. Discuss their expectations of the visit and any concerns, e.g. what to do if they are separated from the group or they feel unwell during the day.
- Talk about the activities that will take place.
- Read out the letter on the back page from the LEGOLAND Design Team to stimulate interest in tall towers.
- Introduce the pupils to the concept of structures.
- Look in travel brochures for pictures of tall buildings. Encourage the pupils to think about the factors involved in building tall structures.



## Activities after the visit

### Paper bridges

- Take a piece of A4 paper and place it between two tables at a distance of approximately 20cm. Flat, the paper will fall to the floor. It is not very strong or stable.
- Roll the paper up to form a tube, fasten it with tape, and place it between the two tables.
- By modifying the paper its stability/strength changes.
- Discuss the findings.
- Fold the paper into other different shapes and test its strength/stability.



### Towers

- Make earthquake tests in the classroom using a homemade 'tiltometer'. Enlarge the tiltometer drawing, stick it on to stiff cardboard and glue a back stand onto the rear to hold it up.
- Ask the pupils to work in groups and build a tower using large LEGO building bricks.
- To measure how earthquake-proof each tower is, place each one in front of the tiltometer and, while holding the base steady, tilt it along the scale. Make sure that the bricks are joined firmly and correctly, otherwise the test will not work properly.
- Before the test, ask the pupils to predict how far along the scale their tower will go and why.
- Discuss the test results. Make a record of the level at which each structure collapses.

