

## Getting Started

Double-click on **Start** to open the case study – this includes teachers' notes.

*Bowland Maths materials are free for educational use in the UK only. You may install the software on multiple computers or a school network provided it is only accessible to pupils and staff at your school.*

## Overview

Pupils take the role of graphic designers in **Design the Mascot** to create a mascot for a fictional new primary school. This image is created using a web-based digital drawing tool package, based upon screen pixels. Pupils work both individually and in small groups to discuss possible designs. They make decisions about the planning, designing, evaluating and re-designing their product and communicate them to others. They also process incoming information via 'management' memos, make recommendations about their product and present their final products.

Mathematically, **Design the Mascot** helps pupils to learn, use and apply concepts of dimensions, proportional enlargement, ratio and linear scale factors, connecting these to area scale factors. Pupils engage in whole-class discussions about the mathematics they have used within the design process.

## Mathematical content

The primary maths used in this unit are proportional reasoning, geometry and measures. Pupils will engage in design, which requires that they cover a specific area of a display. Pupils should be familiar with using ratios and estimating area: relevant extension activities are included for pupils.

Specific Key Stage 3 National Curriculum areas covered include:

- **Key concepts** – competence, creativity, the applications and implications of mathematics.
- **Key processes** – identify the mathematical aspects of a situation or problem; visualise and work with dynamic images; make accurate mathematical diagrams, graphs and constructions on paper and on screen; estimate, approximate and check working.
- **Number & algebra** – applications of ratio and proportion.
- **Geometry & measures** – perimeters, areas, surface areas and volumes; points, lines and shapes in 2D coordinate systems; transformations.

## Organisation and pedagogy

The materials are designed for all pupils in Year 8, and there are extension suggestions that may make this case appropriate for Year 9 and advanced Year 8 pupils.

The typical lesson consists of an introduction (conducted in a whole class discussion), pupil investigations (small group), and reflections (whole class). The role of the teacher is to introduce the topic, and monitor and guide pupils as they work through design questions and mathematical explanations. The included extension ideas can be used for pupils to continue their design work after class.

## Resources provided

This Case Study contains a collection of printable and ICT resources comprising:

- **Introductory Presentation:** (Powerpoint): This introduces each activity to the class, including video messages from the 'client' - if these don't play online you will need to download the case study to see the videos (or play them separately using the links below).
- **Teachers' Notes:** A lesson plan is included that provides instructions as well as suggested prompts for pupils.
- **Pupil Handouts:** There are worksheets required for each pupil.
- **Digital Drawing Tool software:** A simple pixel-based painting tool, with facilities for scaling and translation.
- **Digital Drawing Tool instructions**

Other resources:

- Editable (.doc) versions of the **teacher's notes**, the **pupil handouts** and the **drawing tool instructions**.
- **PDF version of the presentation slides;**
- Videos (mpg) from the presentation: **client message part 1**, **part 2**, **part 3**, and **part 4**.

## Resource requirements (including hardware & software)

The software is suitable for Windows PCs and Apple Macs.

Each group of 2 or 3 pupils will require a computer with access to the Digital Drawing Tool software: download the Case Study and copy the folder `content/DigiTool` to each computer, or make it available on your network. These computers will require a web browser with the **Adobe Flash** Player ([www.adobe.com/downloads](http://www.adobe.com/downloads)) plugin (version 8 or later) installed.

A computer with a data projector - or an interactive whiteboard - with Microsoft Powerpoint, will be needed to show the presentation to the class. If you do not have Powerpoint, a free viewer is available from [www.microsoft.com](http://www.microsoft.com).

Windows users will need [Adobe Reader](http://www.adobe.com/downloads) ([www.adobe.com/downloads](http://www.adobe.com/downloads)) to view the teachers' notes and handouts. The editable versions require Microsoft Word or an alternative (such as OpenOffice).

# Technical details

## Minimum machine and software specifications

Note: these are the recommended minimum requirements for recent versions of Flash Player, which is required to run the "DigiTool" software.

**PC** Windows 7, Windows Vista®, Windows XP, Windows Server® 2008, Windows Server 2003, Windows 2000 Intel® Pentium® II 450MHz, AMD Athlon® 600MHz or faster processor or equivalent 128MB of RAM 128MB of graphics memory Internet Explorer 6.0 and above, Mozilla Firefox 2.0 and above, Google Chrome 2.0 and above, Safari 3.0 and above, Opera 9.5 and above, AOL 9.0 and above.

**Mac** Mac OS X 10.6, Mac OS X 10.5, Mac OS X 10.4 (Intel), Mac OS X 10.4 (Power PC) Intel Core™ Duo 1.33GHz or faster processor Power PC G3 500MHz or faster processor 128MB of RAM Safari 3.0 and above, Mozilla Firefox 3.0 and above, Google Chrome 2.0 and above, Opera 9.5 and above, AOL Desktop for Mac 1.0 and above.

**Linux & other systems** – we do not officially support this, and the software has not been tested on Linux. However, it should work on systems with Adobe Flash Player installed. Note that although the download is a PC '.exe' it is actually a self-extracting ".zip" file which many Linux systems will be able to unpack.

## Installing on a Web Server

If needed, the case study can be placed on an Intranet server: copy the complete "design\_the\_mascot" folder to the server and, if necessary, rename "Start.html" to "index.html" or whatever name your server uses for index pages. To comply with the licensing terms, please ensure that access is limited to staff and pupils at your school.