# Design Specifications for Tall Buildings

## Teacher's Notes

Aims

This pack is aimed at reinforcing National Curriculum material at KS4 in DT in an enjoyable, applied way. It is aimed at students who may potentially go on to study A-Level Physics and has been designed with 1 hour lessons in mind. Additional material is included for able students or as a homework activity.

Curriculum content

Key skills:

- Group work
- Evaluation

Methods covered are:

- Design briefs
- Specifications
- Generating design proposals
- Evaluation

Preparation

Photocopy worksheets for students.

Worksheet 1: One per group

Worksheet 2: Individual extension worksheet

Equipment required

PowerPoint

Timing targets

This pack is designed for a 1 hour lesson, although it contains extension material. A model lesson is outlined below to give timing guidelines:

| | | |
|---|---|---|
| Start | 5 mins | |
| Presentation (specifications: slides 1-5) | 5 mins | PowerPoint presentation |
| Group work (creating specification) | 15 mins | |
| Presentation (examining buildings: slides 6-9) | 5 mins | PowerPoint presentation |
| Group work (evaluation of these buildings) | 15 mins | |
| Class discussion | 15 mins | |

Worksheet 2 – Extension work

Guidance

- The first part of the presentation is aimed at introducing the ideas of design briefs and specifications to the students.
- They then have 15 minutes to come up with some ideas for a specification relating to either brief 1 or 2 on worksheet 1, in groups.
- The second part of the presentation shows several buildings, each designed for different purposes.
- The students can then evaluate the buildings against their specifications, looking at each point on their specification. There are four buildings so groups can evaluate different buildings.
- It is important to remember that specifications they have made may be very specific and the buildings will not conform exactly to these specifications, for example specific heights or floor areas. In these cases the point made in the specification needs to be considered more generally; for example if a building of 15 m was specified, the general point would be 'it is a tall building'.

- The class discussion brings together the overall evaluation of each building.
- More guidance is provided in the answers section.

Points to emphasise

- Many different solutions can be found to fit one design brief. There are usually no right or wrong solutions, as long as they fit the specification and design brief.
- Although you can design different buildings for the same purposes, designers give priority to different points and there are trade-offs. For example:
    - Timescale
    - Cost
    - Size
    - Aesthetics

Mixed abilities

The extension worksheets provide scope for more creative work for higher ability students. Since the lesson contains group work, lower ability students should be well incorporated. The extension sheet could be used for homework which allows for more focused study.

Answers

**Specification**

These are general specifications. More specific comments are made in italics. The student's answers could include:

Context

The building will be located in a city and used for *offices*

The materials will be strong enough to support the building

*The building should encourage social harmony*

Aesthetics

*The building should be tall so it can contain many offices and stand out*

*The building should be made attractive and iconic and therefore must be of a new, innovative design*

*The building should be suited to the type of accommodation required, e.g. sufficient for standard housing, or more elegant for more expensive properties*

Production

Whilst it is always important to minimise construction time and cost, the building should not be constrained particularly by time or money since a modern design with a large structure is required.

Maintenance

Access to services should be made easy so maintenance can be carried out.

Provision should made for safe and easy access to the windows for cleaning, e.g. attachments for baskets or abseilers.

Performance

The building should be built to withstand the forces which act on in, e.g. weight, wind, earthquakes.

**Evaluations**
When analysing the four given buildings it is important to remember that the student's specifications may be quite specific. The general points to consider about each building are given below:

*Taipei 101*
Iconic – tallest building in the world ensures it is widely recognised.
Aesthetic/iconic – modern design
Tall building – meets large floor space requirements
Materials are suitably strong – it is located in Taiwan and therefore has to withstand extreme weather conditions

- This building will probably comply with the specification and brief of an office building, emphasising the fact that it is an iconic structure.

*Trellick Tower*
Tall building – meets large housing requirements *(this is very important for this building's specification since it was originally council housing)*
Does not encourage social harmony
Bad for disabled access due to separate lift shaft stopping every 3 floors
Has become iconic due to its architectural style of brutalism

- There may be some debate as to whether this building complies with the specification and brief. It still attracts residents, with the majority of the flats privately owned by people who like the architecture and image of the building. However, it does have the obvious inconveniences of services and access.

*Lloyd's Building*
Iconic – relatively tall
Aesthetic/iconic – architecture is unique
Services located on outside so versatile inside space – meets space requirements
Very accessible for maintenance - designed with services on outside of building

- This building will probably comply with the specification of an office building emphasising versatile space and easy maintenance.

*Orion Building*
Tall building
Built recently for accommodation
Apartments have sold well
Architecture has been criticised as looking ugly.

- This building will probably comply with the specification of a residential building although again there may be some debate about the appearance of the building.

<u>Extension Worksheet Answers</u>
The answers for this extension worksheet should take the form of the work covered during the lesson but with a different purpose for the building. The examples given are hotels or banks. There is scope for personal creativity and a wide range of ideas throughout the exercise.