Food Technology Spaces in Secondary Schools

Exemplar designs

department for
children, schools and families

Acknowledgements

We would like to thank the following people and organisations:

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Jenny Elms – National Programme Manager, Licence to Cook, Specialist Schools and Academies Trust
Stephanie Valentine – Deputy Director General, British Nutrition Foundation
Gina White HMI – Subject Specialist Advisor for Design & Technology, Ofsted

Case study schools

Archbishop Sancroft Church of England VA High School, Norfolk
Fordwater School, West Sussex
John Hampden Grammar School, Buckinghamshire
Kelsey Park Sports College, Bromley
The King's School, Lincolnshire
The Latimer Arts College, Northamptonshire
Wrotham School, Kent

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Cambridge Regional College
City of London Academy
Impington Village College – special thanks to Shirley Mackenzie
Onslow St Audrey's School
Parkside Community College
Westminster Academy

Specialist contributions

Focus on Food, d-squared[2]

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Images
Some images are original design sketches and have been reproduced at the best quality available.

Contents

FOREWORD

Teaching children how to prepare basic recipes from scratch is fun to do, both at school and at home. It helps young people get the skills to go on to cook healthily for life and is vital in combating obesity. Cooking is already compulsory in primary schools, and the new food technology curriculum for 11-14 year olds, introduced in September 2008, puts renewed focus on practical cooking skills – unlike the old lessons.

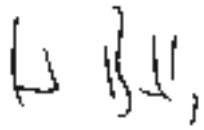
Every secondary school pupil is also entitled to take part in the *Licence to Cook* programme, where students learn to cook and understand the principles of diet and nutrition, health and safety and wise food shopping. But we want every young person to have the opportunity to gain these key life skills, which will help them not only during their time in education, but for the rest of their adulthood. That is why we have taken the step of announcing that cooking will become compulsory at key stage 3 in all maintained schools from September 2011.

We all know that cooking a delicious and nutritious dish can be hugely rewarding and fun, and when this takes place in an exciting environment, the experience becomes an even more enjoyable one. Our unprecedented investment in school buildings provides a wonderful opportunity to provide practical and inspiring food technology spaces in every new or remodelled school.

In the three years from 2008 to 2011, local authorities and their schools have been allocated £21.9 billion, enabling new and improved classrooms, laboratories and food technology spaces. A major part of that allocation is for *Building Schools for the Future*, the largest capital investment programme for 50 years, which is providing world class teaching and learning environments for all pupils, teachers and communities in England. The Primary Capital Programme, supported by £1.9 billion of new capital investment over the three year period 2008-2011, is intended to renew at least half of all primary schools in England by 2022/23, bringing them up to 21st century standards.

For those secondary schools currently without facilities, the DCSF has provided more than £60 million of ring-fenced capital investment to build food technology areas to help ensure that schools have up-to-date cooking facilities by September 2011.

I am very pleased to introduce this book showcasing exemplar designs for food technology facilities in schools. It will be enormously valuable to local authorities, building professionals and schools. These designs result from close collaboration between designers, curriculum specialists, school staff and students. I look forward to the first projects being in use by students and teachers in autumn 2010.



Ed Balls
Secretary of State for Children, Schools and Families

INTRODUCTION

This project set out to promote innovative food technology facilities that not only support 21st century approaches to teaching and learning but also inspire teachers and learners themselves.

Three leading architects created seven designs for practical facilities to teach food technology, working closely with each school to ensure the concept designs met their particular requirements. Their brief was to create inspirational and innovative designs to inform schools and local authorities across the country.

This book should be read alongside its sister publication, *Food Technology Spaces in Secondary Schools: A design guide*, **published in 2009, which focuses on the practical aspects of designing a new food technology facility.**

How the project worked

The designers worked in partnership with staff and students at each school, holding workshops to develop innovative design concepts by considering:

- **the current and future requirements of the school**
- **designs that would be practical and affordable for other schools to replicate**
- **the most effective settings for teaching and learning, particularly practical work**
- **the needs of individual learners, including those with special needs, and the wider community**
- **the school grounds as a place for teaching and a learning resource**
- **how to fully exploit the latest technologies for learning.**

Each of these schools developed one food technology room. (Other schools – especially new schools funded through Building Schools for the Future (BSF) – might build more than one.) The rooms are intended not only to meet the compulsory entitlement of key stage 3 but also for key stage 4 and post-16 education in food subjects. They might also be used for catering and hospitality courses in the future, including Diplomas.

The schools were supported in the project by Licence to Cook lead practitioners, who drew on their past experience of working with schools with food rooms to help these schools crystallise their ideas.

All the schools in this project received £300,000 of capital funding as part of a DCSF initiative to support schools that do not have a practical cooking space. Schools and local authorities were free to supplement this from their delegated budgets if they wished. All those involved were aware that the proposed designs should be deliverable within the funding available.

About the book

The designs in this book are the proposals put forward by the architects involved. The food technology rooms will not be built exactly as they are shown here but the designs are intended to spark ideas and inspire other schools. They are not blueprints to be copied just as they are – other schools will need to base their plans on their own circumstances, priorities and teaching and learning strategies.

This book is for anyone – designers, school heads, governors and local authority officers – involved in providing new or refurbished cooking spaces in schools, whether as a small-scale project or as part of a whole-school development under BSF or Academy programmes.

Section 1 begins by describing the process of briefing for and designing these new food technology rooms. It then pinpoints the key issues that schools and designers had to bear in mind as they developed their proposals.

Section 2 examines the seven design proposals, illustrated with floor plans and three-dimensional sketches for each school. It shows how and why the schools and architects came up with their plans and includes information about furniture and equipment, ICT and sustainability.

Learning from the project

Process and design issues

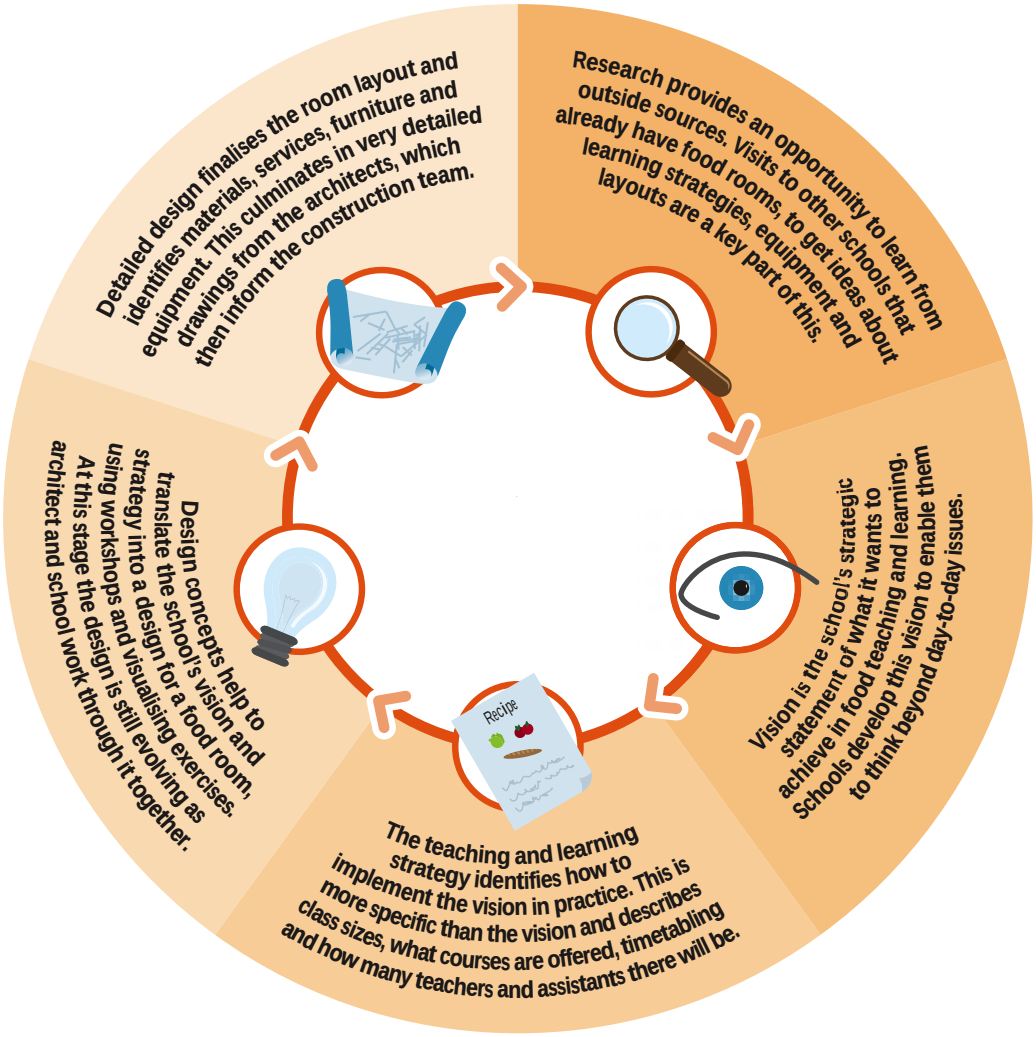
This section starts by describing the key stages in designing a food technology space. It then explains the main issues to bear in mind during the design process: quality, flexibility, practicality, comfort and accessibility, creative thinking and sustainability.

PART A: THE PROCESS

The design process itself is critical in realising the ambitions for new or refurbished food technology rooms. Although there is no one template for managing this process that works for every school, each of the case study schools in this project identified five clear stages (outlined in the diagram below): research, vision, strategy, design concepts and detailed design.

None of these stages was dealt with in isolation, and iteration between them was inevitable, with decisions made in one stage affecting thinking on the others.

At each stage, the people most affected by decisions – students, teachers, technicians and the school's management – had an input. All three design teams ran workshops for staff and students so that they had a hand in setting the brief and, ultimately, shaping their facilities.



It was important that the architects, students and staff involved in the design process did not feel constrained. There were opportunities to inject creativity at each stage, whether considering stimulating teaching and learning approaches or innovative design.

Some students used collages to communicate their ideas about their new food technology room.

Food-based activities are a wonderful opportunity to surprise students and take them into an environment they are unlikely to encounter elsewhere in the school. The most exciting and rewarding learning experiences often come from bold, unconventional solutions that look quite different from traditional cookery rooms. (Examples in this project include one room inspired by a sushi bar, another influenced by a theatre, and several outdoor growing areas.)

Research

As well as visiting food technology rooms in other schools, the design teams consulted *Food Technology Spaces in Secondary Schools: A design guide* **as background to the practical aspects of designing food technology rooms, along with the Design and Technology Association website, www.data.org.uk**

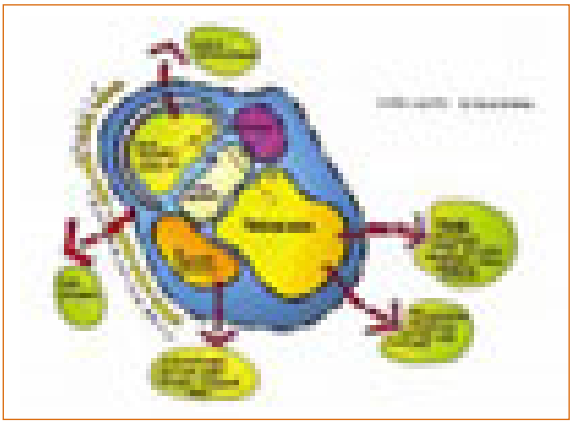
The designers, students and staff also drew on their own personal experiences of high quality food outlets and even market gardening. These 'informal' parts of the research process came through in a number of the design ideas.

Vision

'Vision without action is a dream. Action without vision is simply passing the time.'
Joel Barker, change consultant

The schools and designers involved in this project understood the importance of a clear plan for the future. All the schools found it helpful to summarise what they wanted to achieve in a sentence or two – and this proved helpful for the designers when they were working up their designs.

Designers created this 'seed to spoon' logo to symbolise Kelsey Park's vision – that students should understand everything about food from the source of the ingredients to the finished product.



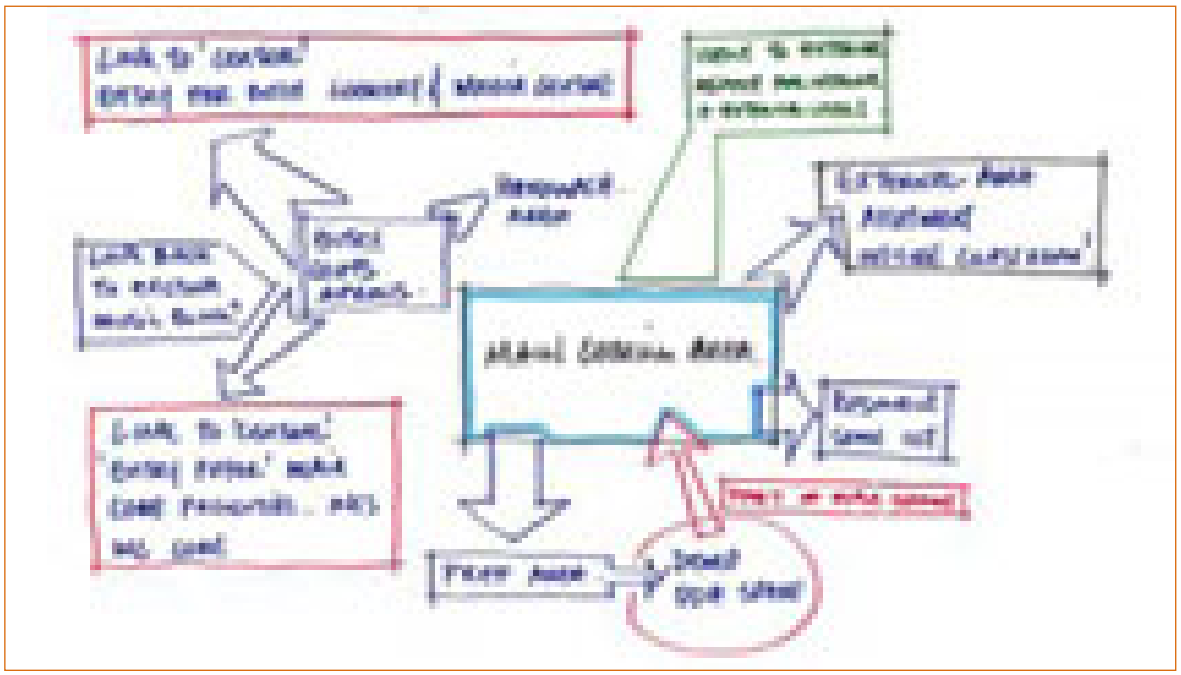
Concept sketches were a good way of checking the designer's understanding of the school's needs.

Teaching and learning strategy

Establishing the school's teaching and learning strategy, through the preliminary workshops and discussions, was an invaluable basis for teachers and architects to shape the design brief. Discussions about what each school wanted to achieve built on decisions about all the elements that affect teaching and learning about food, including:

- **how the curriculum is organised**
- **what range of courses might be offered (including 14-19 Diploma courses such as Hospitality)**
- **cross-curricular links between subjects (such as science)**
- **how to ensure a personalised approach to learning**
- **the structure of the timetable**
- **the size of student groups**
- **how learning changes as students progress through the school**
- **teaching and learning styles, in particular the role of the teacher and (where relevant) technician.**

The schools thought through other issues that could impinge on their accommodation needs, such as: Would students provide their own ingredients? How would fresh food be stored? How would ICT be used? Would there be community use of the facilities? Would students grow food on the school site?



Designers recorded key messages from the workshops.

The variety of workshops each of the design teams offered helped to build a shared understanding of what the schools wanted to achieve. Workshops also helped determine the range of activities that would take place and how they would be organised. This in turn made it easier for designers and schools to agree on appropriate settings to feed into early designs.

Even at this early stage, schools and designers had to consider the cost of their aspirations and relate that to the available budget.

Design concepts

The design briefs that emerged from the vision and strategy stages were different for each of the seven schools. However, each of the schools identified a basic range of activities to accommodate, many of which will use ICT:

- **Watching or carrying out demonstrations**
- **Designing and developing ideas**
- **Planning and discussing how to organise their practical work**
- **Sensory and product evaluation**
- **Reflecting on their work and discussing it with other students**

Designers worked with each school to establish the most appropriate 'setting' for each activity. In the context of school design, a setting is a learning environment defined by the activity, the group size (for example, whole class, groups or pairs) and the furniture, equipment and services needed to support them.

Some parts of the food technology room could provide multiple settings but schools and designers had to be confident that there was a place for all the activities listed above. There also had to be space for students to display their work and sufficient storage for food and equipment.

As part of the workshops, many of the schools found it useful to imagine how space(s) would be used over the course of a day. They looked at how students and staff need access to different parts of the room, how staff would prepare resources in advance of lessons, and whether there were any foreseeable health and safety issues. Thinking ahead in this way can flag up important issues at an early stage.

Every design had to accommodate a basic range of food technology activities.

Demonstrating practical skills

Whole-class discussion

Hands-on experience'

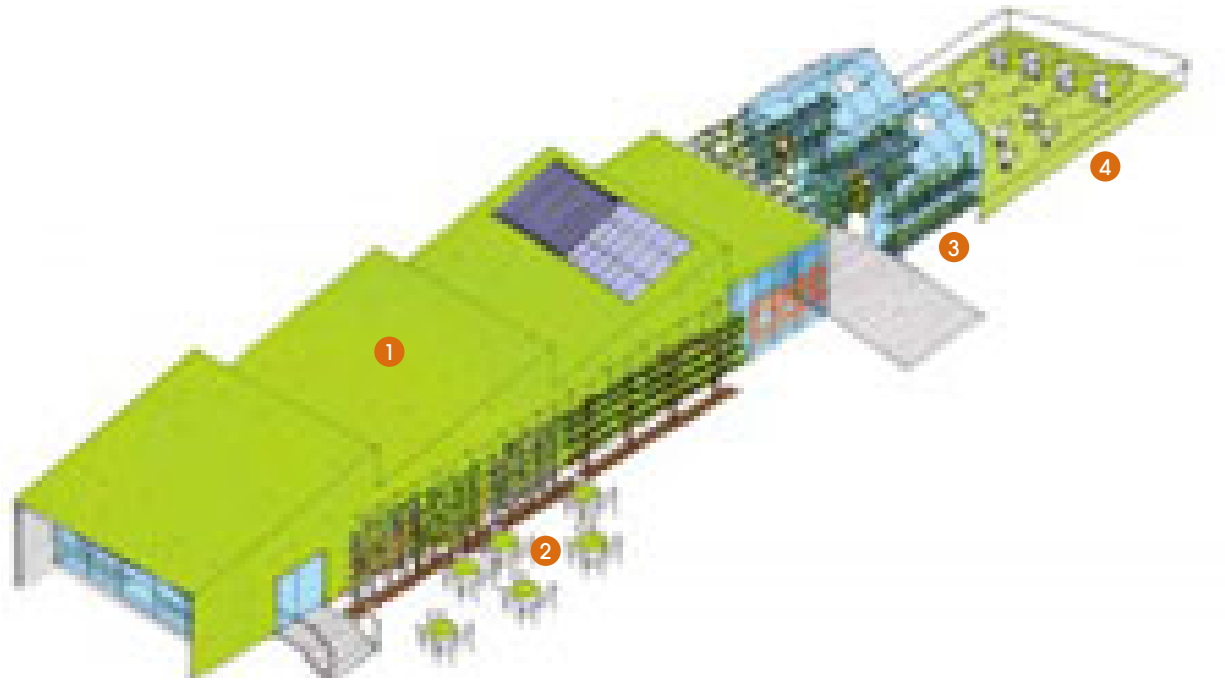
Talking through their work – individually, in pairs or groups

A range of settings

Different settings suit different learning activities, and some possible settings for food technology are often overlooked. Staff, students and designers in this project collaborated together, often using workshops to explore possibilities and shape the range of settings in their design.

Several schools made good use of outside settings – providing decking outside the food technology room, for example, for tasting food or presentation work. Others wanted settings in the school's grounds to allow students to grow food.

The schools had different approaches to inclusive design and environments that support personalised learning. For example, some designed a space for individual quiet reflection away from the practical area. All schools provided settings for wheelchair users.



The Latimer School design has various settings, reflecting all stages of food production and consumption: an indoor practical space (1), an outdoor café (2), greenhouses (3) and a chicken coop (4).

Students learn a great deal from growing their own fruit and vegetables, however small the plot.

Detailed design

Designers were not required to produce detailed design for the schools in this project – the drawings included here do not include the level of detail that would be needed by builders, electricians and plumbers. However, some of the teams did start to look into detailed design questions – like colour schemes, the choice of materials and equipment. A number of them asked staff and students to create 'story boards' showing examples of furniture, finishes and fittings they would like to see in their food technology room.

It is important that the dialogue continues between schools and their designers to ensure that facilities meet their needs. The choice of equipment, furniture and finishes should all be made with the people using the facility.

For more information about detailed design, see CABE's *Creating Excellent Buildings*.

Location and budget

At an early stage in the process, the schools and their designers had to consider where to put the food technology room. The location of the new facility sends strong signals about the schools' commitment to food technology. Most schools chose very visible sites, so that all visitors would see the food technology room and students would know immediately where it was. Some were very keen to site the room close to or inside the rest of the design and technology (D&T) department. This important decision reflected the schools' approach to food teaching.

Each team investigated the potential of unused or under-used rooms that could be converted or extended, some of which brought the benefit of a more central location, as well as an environmentally sustainable solution. In some projects, a new building was essential but this meant that the link to the rest of the school became a more significant issue.

In each project the architects explored a range of options, considering the strengths, weaknesses and costs of each location. Every team was encouraged to think about future expansion.

All these schools needed a single food technology room but similar considerations apply where more rooms are being provided (although the choice of site is likely to be more restricted).

The option of using an existing building – either refurbished or extended – as opposed to a new building is likely, nevertheless, to have cost implications. Schools need to be confident there is sufficient funding to pay for the solution they choose, including the cost of equipment and resources. It is essential to involve a professional cost consultant before starting detailed design.

Wrotham School plans to build a pod on a conspicuous site at the front of the school. It has bold graphics and it will be immediately apparent to students and visitors that it is a food technology room. This pod is also designed to be movable, so it can be relocated to another part of the site when the school is remodelled.

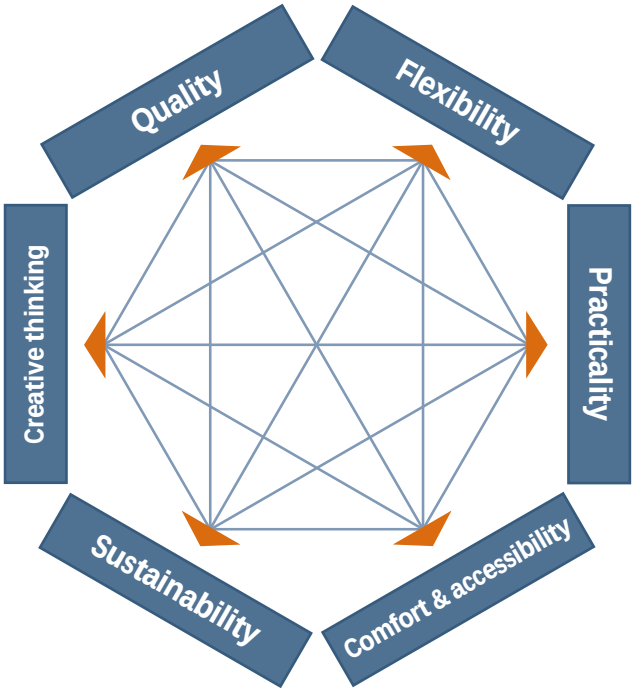
Key points

1. Start by defining the school's approaches to teaching and learning, both now and in the future.
2. Be bold – students often respond well to new approaches.
3. Ensure concept designs suit all planned activities and group sizes.
4. Consider different settings for different activities.
5. Reflect carefully on where to have the food technology room.
6. Establish a clear budget at the start and work within it.

PART B: DESIGN ISSUES

The decision makers in this project had to consider broad and far-reaching issues, which inevitably informed decisions on their 'design concepts' and steered the direction of their work.

These design issues inter-relate in complex ways and each school prioritised differently – there is no single solution which works in all situations. The main issues are shown below and explained in more detail in this section.



Quality

Quality is an important consideration in any new teaching and learning room. But what is 'quality'? Part of the answer is about making sure that a new room is fit for its purpose and that different learners and teachers are supported in what they want to do. But quality encompasses more than this – high standards of layout, materials, furniture and equipment can actually help to attract and inspire students.

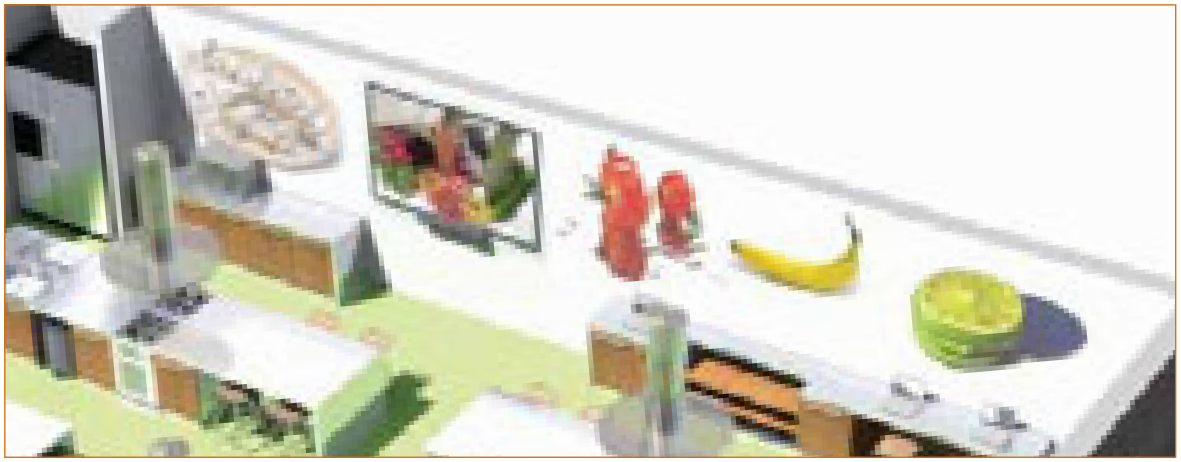
The desire to provide a high quality teaching and learning environment was common to all schools in this project. Several decided on a very prominent location for their new facility, raising the status of the subject and inviting participation.

Colour, graphics and texture

Very often the room's prominent position was enhanced by colourful and lively graphics used as external signage, identifying the food technology room immediately. Colour, graphics and texture also featured strongly inside the room in most designs. Some of the schools picked up on colours from the school logo or uniform. Others opted for colours used in D&T. Colour can lift a room and make it an invigorating place for students and teachers to work. It can be used to mark zones within the room, or to explain simply to students where different equipment is stored.

Graphics have become widespread in interior (and exterior) design, and attractive graphics can enliven a food technology room at modest cost.

The external graphics at Wrotham School give a strong identity to the food technology room.

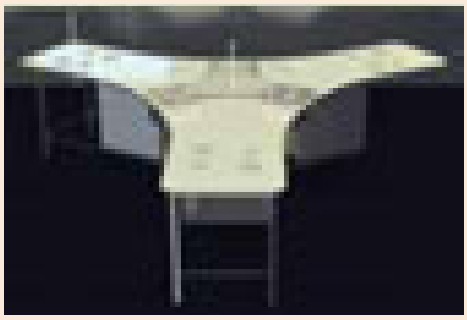


Printed or projected images inside a room can be both inspiring and informative.

Furniture, finishes and equipment

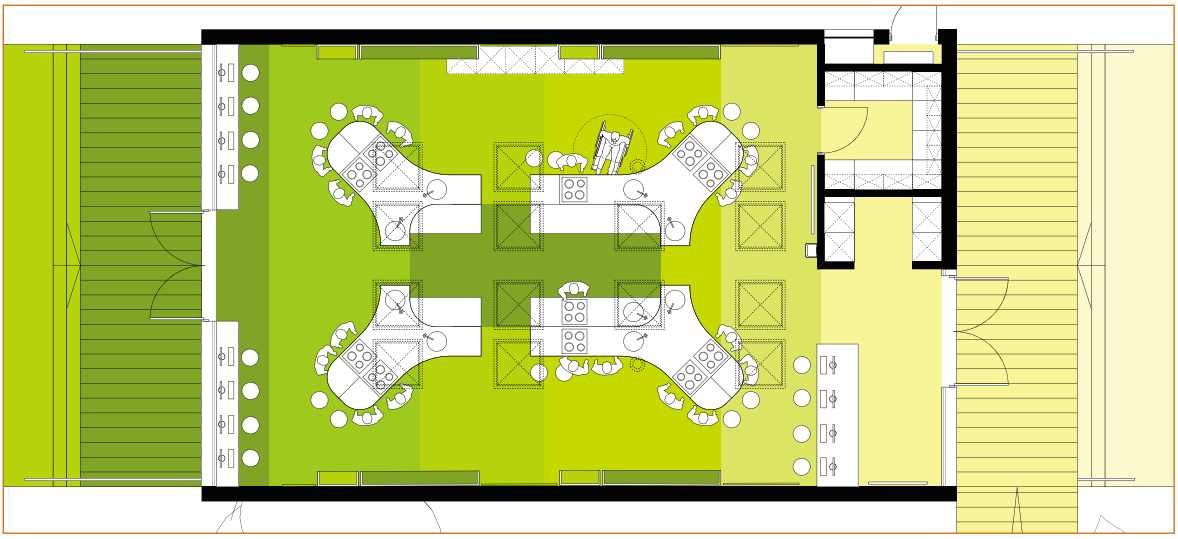
All the furniture, finishes and equipment in a food technology room need to be robust enough to cope with very intensive use. A typical facility will see a great deal more use than a domestic kitchen, and inferior quality furniture or equipment will not only prevent staff and students from carrying out an activity but may also de-motivate them. The schools in this project wanted durable, resilient furniture and appliances to reduce the risk of needing repairs. It is tremendously valuable to talk to other schools with food technology rooms to find out which furniture and appliances last the best – and which to avoid.

The high quality 'trimerang' work units at Kelsey Park Sports College will help to inspire students and show them that food technology is an innovative, exciting subject, where good design is welcomed.



Layout

The layout is a critical part of high quality design and should send positive messages to students – possibly by linking to familiar layouts from high quality commercial food environments or elsewhere (see also the section on Practicality, p22).



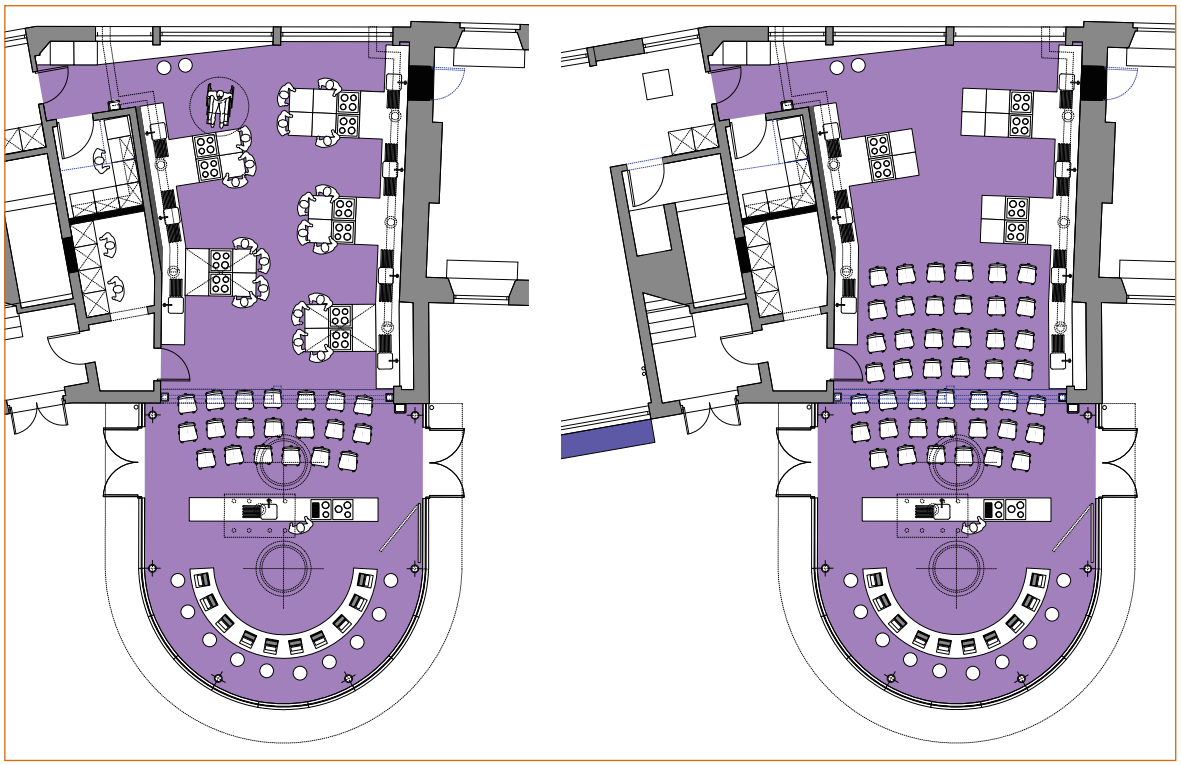
A sushi bar was the inspiration for the layout of Wrotham School.

Key points

1. **Choose equipment for durability and easy maintenance.**
2. **Specify good quality furniture.**
3. **Design the space to suggest that a quality environment equals a quality experience.**

Flexibility

Food technology rooms are used in a variety of ways for different learning activities. Teachers might want to organise their classes differently, while the ages of the students and the courses offered might require different support from their facilities. The design and layout of food technology rooms should reflect this and allow variety in how classes are run.



Some of the benches at The King's School can be moved (right-hand diagram) to allow a larger audience to watch cooking demonstrations.

Teaching and learning

Personalised learning is about giving every young person the support and opportunities they require, whatever their needs, abilities, background or circumstances. Students learn in different ways, which has implications for all learning spaces, including food technology rooms.

The schools and designers in this project considered how different learning styles impact on the accommodation for food technology. They thought about where and how students would 'do', 'feel', 'watch' and 'think', and how their designs could enrich the activities that help them learn.

The teams imagined different scenarios for the space and made sure they had the right equipment, in the right location, for a variety of patterns of use. Their room layouts allow teachers to move around and work with their students in the practical and other tasks they carry out. They also considered how teachers might carry out demonstrations – some wanted the flexibility to be able to do so from students' benches rather than from one designated place.

At Fordwater School, flexibility is key because students have a wide range of different learning difficulties and disabilities, so the food technology room has to offer the opportunity to use a wide range of teaching methods.

Thinking longer term, the teams had to bear in mind that the ways students learn about food is changing. Innovation in teaching and learning helps to keep students engaged, and food technology rooms must be adaptable. Although the schools were primarily concerned with accommodating food technology, they also had to look ahead to a time when they might be offering other courses, such as the Diploma in Hospitality, which include food-related topics. Commercial cooking and catering has changed enormously in the past 10 years and the teams were keen to draw inspiration from this.

Despite having no specific facilities, some of the schools already had cooking clubs and other out-of-hours food activities, including community use, which will continue in their new food technology rooms. This requirement means that the rooms need to be flexible. All the schools planned access routes to their rooms bearing in mind security issues (such as making sure visitors don't stray where they shouldn't).

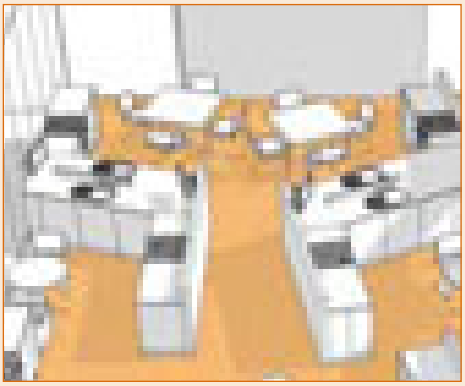
Furniture

Furniture can support flexibility by allowing students and teachers to change the way they use the room to suit the activity and different teaching and learning styles. For example, movable serviced trolleys can make it easier for teachers to give demonstrations in different locations. Movable tables mean that students can work in different sized groups, depending on the work they are doing. At Archbishop Sancroft High School, serviced tables were fixed but additional loose tables can be arranged differently to create other types of work areas.

ICT

All the design teams were aware that ICT can open up significant opportunities to improve the flexibility of food technology rooms. Both the schools and the designers were keen to incorporate mobile computing – including wireless facilities – and presentational technologies, without necessarily having dedicated ICT areas.

At Archbishop Sancroft High School, the tables and chairs within each practical bay can be moved around according to students' needs. Computer screens at each workstation allow students to access ICT at any time during practical activities, enabling them to use resources such as on-line recipes and demonstrations of cooking or food preparation techniques.



Key points

1. **Design facilities to allow different styles of teaching and learning.**
2. **Allow for technological changes – new forms of ICT and new food appliances.**
3. **Make sure the room supports personalised learning.**
4. **Consider how it will be used out of school hours.**
5. **Think about how furniture can improve flexibility.**

Practicality

This section illustrates and adds detail to the practical considerations discussed in 'Food Technology Spaces in Secondary Schools: A design guide'.

Layout

In the short term, the layout of a food technology room must take account of a number of practical issues:

- **How teaching and learning activities will be arranged in the space**
- **Sight lines between staff and students**
- **How students will move around the space**
- **Access for all students**
- **Ensuring students are safe at all times**
- **How the timetable will work**
- **How teachers and students intend to use the room**
- **How many students the food technology room needs to accommodate**

The schools and designers in this project considered all these points as part of their early work and all were covered in each school's brief.

Appropriate equipment

The range of furniture and equipment has to support different learning activities. Schools wanting to offer Diploma courses may also need specialist catering equipment that meet industry standards. The design teams identified that in some lessons students might undertake the whole spectrum of tasks, from watching a demonstration, to researching, planning and practical work, along with tasting and reflecting together on what they have produced.

Different activities may be going on in the same space at the same time.

Each case study in this book allows for all these activities, although their strategies differ. In some cases different zones of the food technology room were developed for different activities (typically, more than one activity in each zone), while in other cases all areas of the room can be reconfigured (for example with ICT, furniture or equipment) so that they lend themselves to different learning activities.

The schools in the project were careful to cater for high levels of ICT in the classroom. A key decision was whether ICT should be solely in the food technology room itself or in an adjacent room, and whether to use laptop or desktop computers. ICT can help students work at their own speed and is also a useful tool outside the classroom. (The Licence to Cook programme is very valuable in providing on-line tutorials, assessments, recipes and videos.)

Storage

Storage is important in food technology rooms, both for ingredients and finished food. All the designs in this project take account of the need for refrigeration and for locating storage space conveniently for students to access.

Maintenance

The food technology room will inevitably need regular maintenance throughout its service life and the design teams were asked to consider long-term implications – for example, making sure there is easy access to electrical, gas and water services to make it faster and more economical to carry out repairs.

Key points

1. **Try to optimise efficiency – make it work for teaching and learning.**
2. **When you are planning the layout, think about what happens where.**
3. **Specify the most durable materials you can.**
4. **Think about hygiene and ideally locate the laundry space away from the cooking area.**
5. **Keep health and safety top of the list of priorities.**

Comfort and accessibility

Food technology rooms pose particular challenges that are not present in classrooms for other subjects. Hot appliances mean that the rooms can become uncomfortably warm even in winter, so ventilation is critical. The position of service outlets and fixed benches may also compromise easy access for disabled students, and poor acoustics can make it almost impossible for students with hearing impairments to learn.

Heating and lighting

All design teams were keen to ensure that the food technology rooms for these schools should be cool, comfortable places to work, with good daylight. They felt that this helped student concentration as well as producing a pleasant working environment for teachers and technicians. The emphasis in most of the rooms was on adequate ventilation to allow heat to escape.

Some of the designers thought about high 'thermal mass' – using heavyweight building materials like brick, tiles and stone, without covering the materials with plasterboard or timber. This can make a big difference to peak summer temperatures, especially if coupled to night cooling, where the room is ventilated at night.

One designer looked into 'ground cooling', where an underground labyrinth or a long underground pipe is used to bring cool air into the classroom. However, all the designers avoided using air conditioning because it adds so much to climate change emissions.

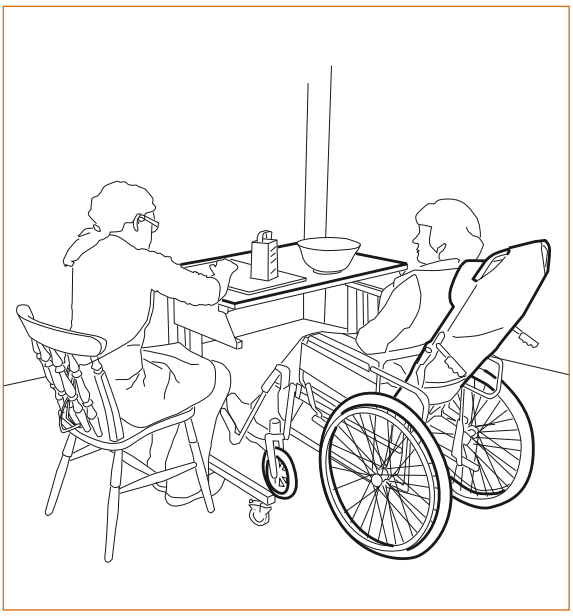
A space with good daylight and light surfaces can be a pleasant place to work.

Accommodating individual needs

All the schools and designers considered disabled students in their designs. Several proposed height-adjustable workbenches, ovens, hobs and sinks, to make it easier for students with mobility problems to take part in practical work.

The schools were keen to address the wide range of heights of students who will use the room – the design of hobs and sinks in particular is critical to health and safety. The ergonomic website www.schoolfurniture.uk.com can help in specifying these heights.

All students should be able to work in comfort, including those with physical disabilities.



Height-adjustable work surfaces make practical work easier for wheelchair users.

Sometimes colour and texture were used to help students with visual problems find their way around the food technology room.

Acoustics

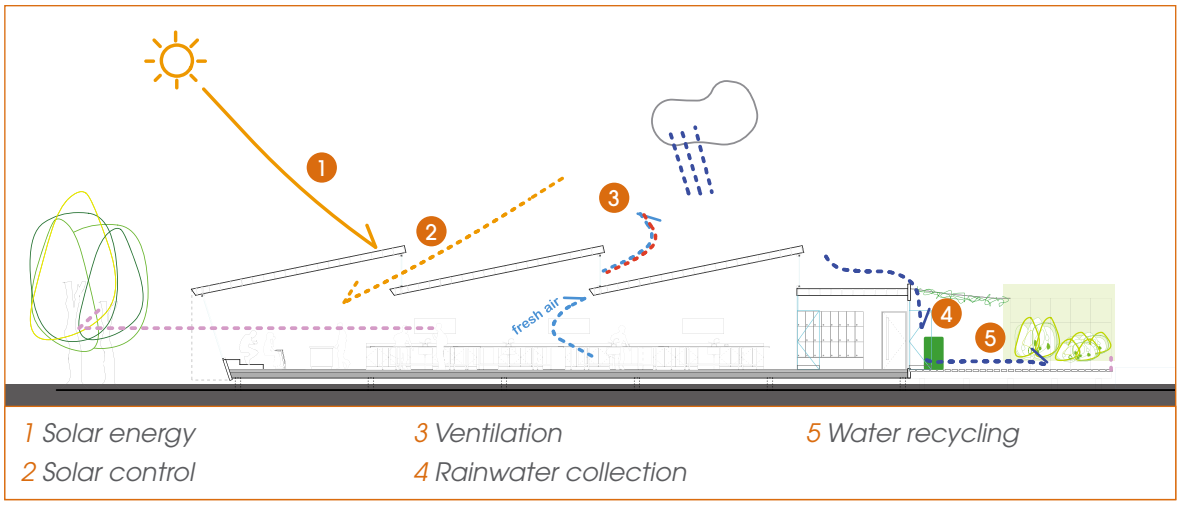
Acoustics are critical too – not only for students with hearing problems, but for all students and staff. Preparing food can be a noisy activity and sound-absorbent material can help to reduce the noise level in the classroom. There is more guidance on this in *Building Bulletin 93: Acoustic design of schools***.**

Key points

1. **Consider ventilation and heating very carefully.**
2. **Make sure the room is fully accessible for all users, including students with special needs.**
3. **Take expert advice on acoustics.**
4. **Think about the ergonomics of all appliances and utensils.**

Sustainability

Food technology rooms use a great deal of energy for cooking, refrigeration, hot water and food processors. This results in climate change emissions as well as high running costs. The rooms also use a lot of water, food ingredients and cleaning products, all of which have an environmental impact.



Each design team had to consider the environmental impact of their new building.

Fuel

Both gas and electric cookers contribute to climate change, although emissions from conventionally generated electricity are about double those for gas. Other appliances used for preparing and storing food also use considerable energy, especially freezers and blast chillers.

The schools and designers in this project were aware of energy issues. All tried to allow the maximum amount of daylight into their food technology rooms, for example, using large windows and/or rooflights. Some also looked into using renewable energy to provide heat or power for the rooms. Those who chose to specify products opted for low energy appliances.

Construction

All design teams chose their materials for sustainability, since different construction materials result in different magnitudes of environmental impact. Locally grown, sustainably managed timber, for example, has a low level of impact on the environment, whereas concrete uses huge amounts of energy in production and relies on mining materials from the earth. Designs therefore often favoured natural materials over synthetic ones, and locally produced materials rather than materials imported from distant countries. Designers also tried to use materials with low 'embodied energy' (the energy used for their manufacture and transport), to avoid excessive climate change emissions.

Ultimately a building with a long service life is more sustainable. Most of these designs are intended for the long term – longevity and durability were watchwords for the schools, although two valued the option of being able to move a lightweight building above outright durability.

Recycling

It should be possible to recycle food packaging and compost food waste easily. Some of the schools designs in this project have built in recycling storage points and/or plans for composting food waste from the start.

These schools also acknowledge that their food technology rooms will inevitably use large quantities of treated water (which itself results in climate change emissions, as well as adding to water shortages). Some of them identified low water washing machines and dishwashers and restricted flow taps to save water. Others looked into rainwater harvesting as a way to use water falling on their roofs for cleaning and laundry.

Key points

1. **Ensure the room minimises energy use and climate change emissions.**
2. **Design the facility for longevity.**
3. **Choose sustainable materials where possible.**
4. **Consider how the food technology room can promote recycling and composting.**
5. **Think about water use and how to cut the use of mains water.**

All schools were keen to recycle food packaging.

Creative thinking

All the schools and designers in this project thought beyond traditional ideas about food technology rooms. They looked for creative solutions to catch students' imagination and draw them into a subject they have probably had little experience of in school. By making the exterior of the food technology room visibly different from other teaching rooms, these designs will help to enthuse students before they even enter the space.

The creativity displayed in the students' collages informed and inspired the designers.

New learning approaches

The schools were open minded about new approaches to learning about food – and of the implications these approaches have for designing new spaces. One of the schools, The King's School, worked with its architect to develop the students' vision of a new room that lends itself to 'cooking as performance', drawing some design cues from TV cooking shows that have a following among students.

A raised bench set against a curved glazed wall gives demonstrations a sense of performance.

Contemporary graphics and lighting

Most of the designers in the project saw bold, contemporary graphics as an inexpensive opportunity to make the food technology room more attractive for students. They also viewed these graphics as a design feature that is easy to change over time to keep it fresh, in contrast with other design elements, which can be costly and disruptive to change. One school used special lighting so that teachers can choose the right mood for what they are trying to achieve.

Strong graphics can denote areas of activity as well as add visual appeal.

Making the most of the site

Looking beyond the obvious solution can help to capture students' imagination and make the settings more engaging. All the schools and designers in this project did just that. Kelsey Park Sports College, for instance, is locating its food technology room next to the dining hall, which means students can serve the food they have cooked to each other in the dining area.

Kelsey Park Sports College chose to convert a former drama space – rather than build a new block – because of its links to the dining area.

Most schools plan to make the most of the outdoors. Two of them intend to use outdoor food growing areas so that students see the whole story from seed to plate – dRMM's scheme for Latimer Arts College, for example, was zoned into the activities necessary for food production and includes building a greenhouse so that students can grow food all year round. There are wonderful opportunities to learn in such circumstances, unsurpassed by more traditional approaches to teaching and learning.

Capturing the imagination

The food technology rooms in this project are geared to supporting and encouraging teachers to use different activities to hold students' attention and build their enthusiasm. Several of them plan to install video capture and replay facilities. Demonstrations can then be recorded and played back, either as live feeds for better viewing (especially useful for disabled students), or for replaying later (at home, for instance, using the school's website). Such facilities can also allow teachers to bring professional chefs into the classroom – another way to build student interest.

Key points

1. **Consider unconventional approaches to teaching about food.**
2. **Try to include opportunities to display students' work, to inspire them and other students.**
3. **Use exciting graphics, colours and lighting to enhance the image of food technology.**
4. **Find a prominent location next to existing D&T rooms, if possible.**
5. **Explore how to use outdoor teaching space, not just indoors.**

Case studies

Seven exemplar designs

This section shows the final designs and how they evolved from the particular priorities and circumstances of each school. Some schools had existing buildings they could convert, while others needed entirely new buildings. All of the designs were intended for 20 students.

Archbishop Sancroft Church of England High School

Number of students:	Local authority:	Age range:	Architect:
405	**Norfolk County Council**	**11–16**	**DEGW**

Context

Archbishop Sancroft High School is a specialist science college in a rural location. Its architecture is a mixture of original 1960s buildings with additions from the '90s and early 2000.

The school hopes to landscape a disused bicycle storage area in front of the school to provide allotments, where food could be grown for use in lessons.

Developing the vision

The High School wanted food technology to be independent of other design and technology (D&T) curriculum areas but was keen to reinforce the links, not just with D&T, but also with other subjects, such as science.

The school sees itself as a social enterprise, open and inclusive. Part of its vision was to use the new building to help engage with parents and the local community, and the food technology room had to have the capacity to accommodate higher level vocational courses for the community. The architecture needed to translate their forward-thinking and enterprising approach into an inspiring new space.

Personalised learning is central to the school's teaching and learning approach and most students are independent and motivated learners, keen to adopt new technology.

The way forward

Location

The school wanted an attractive standalone facility in a prominent location near the main entrance, visible from the road and with easy access for the local community. The chosen site at the front of the school is close to the proposed allotment area.

1 Proposed allotments

2 New food technology room

3 Main school entrance

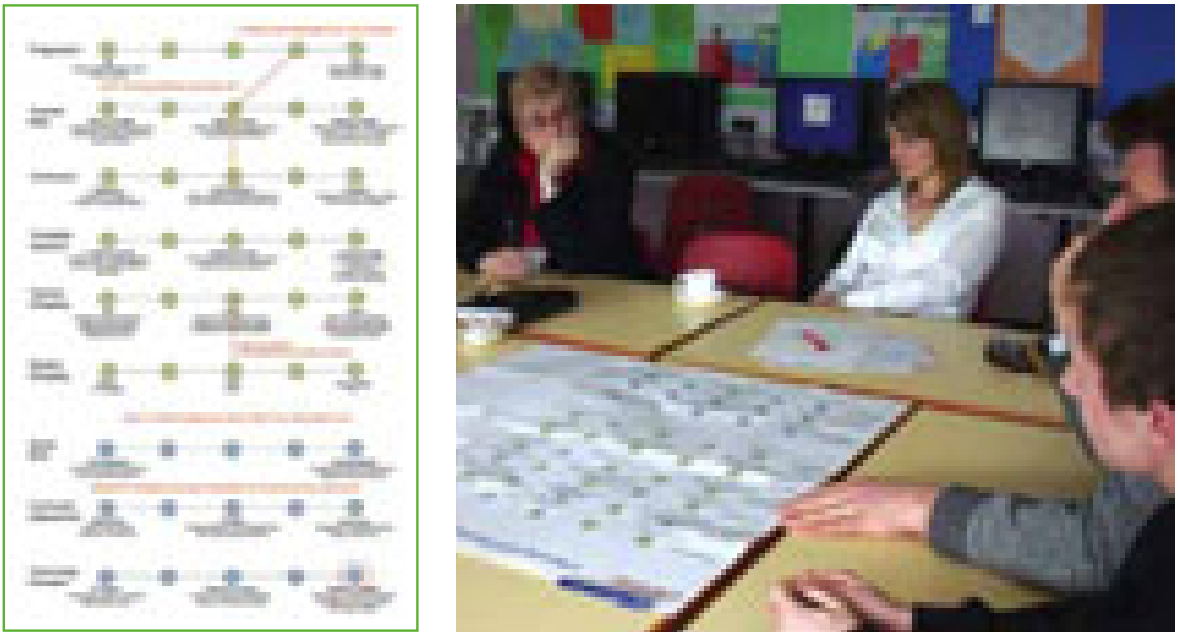
The new building has a prominent location at the front of the school.

Involving staff and students

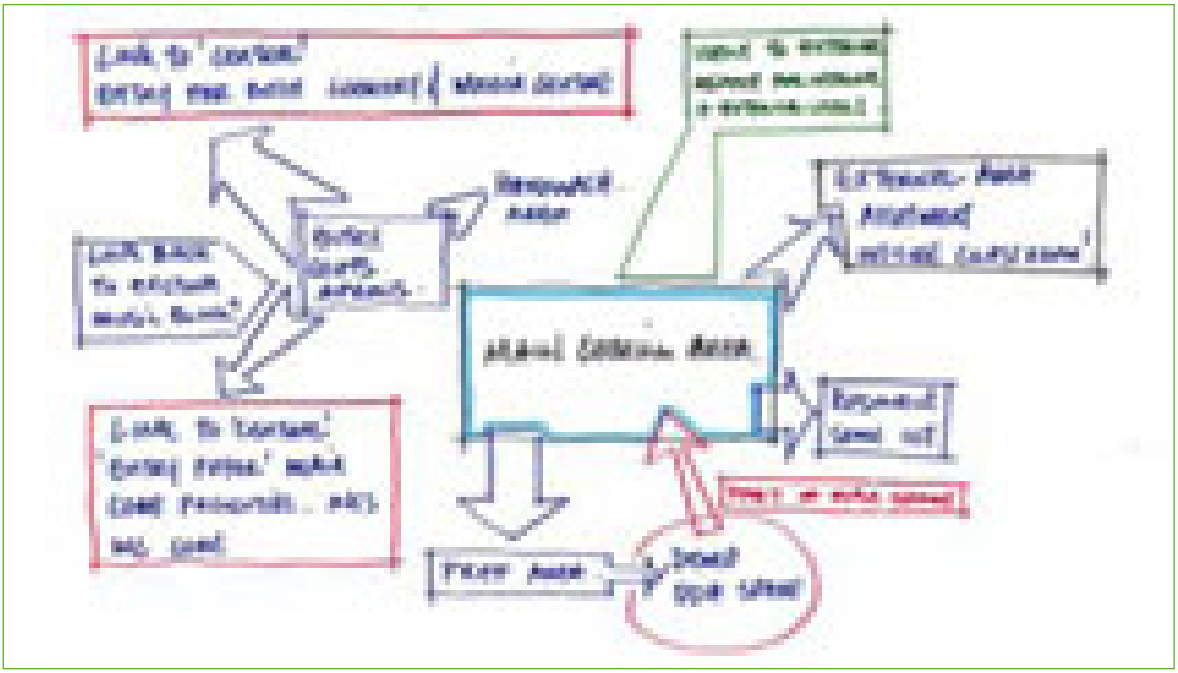
The architects held workshops with students, teachers and senior staff using a data-gathering tool to guide discussion, before considering the specifics of the space.

They explored participants' personal experiences and, using the tool, pinpointed the school's approach to teaching and learning, its aspirations for teaching cooking, its organisational structures, and its preferences for environmental factors. Finally, they used this information to identify settings for the subject. The data was captured as bubble diagrams and icons, which depicted important information without becoming space-specific. This process led the school toward a food technology room with freedom of movement and a shared sense of ownership.

Later workshops enabled students and staff to decide what they wanted by compiling 'mood boards', with samples of colours, surface textures, lighting, photographs and examples of branding, to convey the atmosphere they were looking for in the new room.



DEGW used a data gathering tool in staff workshops to identify key information on how the school operates.



Designers translated findings from the workshops into a zoning diagram showing key relationships between facilities.

The designs

DEGW's food technology room layout allows for whole-class activities and provides self-contained workstations and study areas for students working in pairs or small groups. The school was able to secure extra funding for community use and the room is therefore larger than the other designs in this project.

All the workstations can double as demonstration areas, so there is more freedom for the teacher to vary the teaching focus than in traditional rooms. This also makes it less formal and casts the teacher in more of a facilitator role than conventional layouts.

Strong colours and bold graphics enliven the room. A change in floor colour denotes clear circulation routes between workstations.

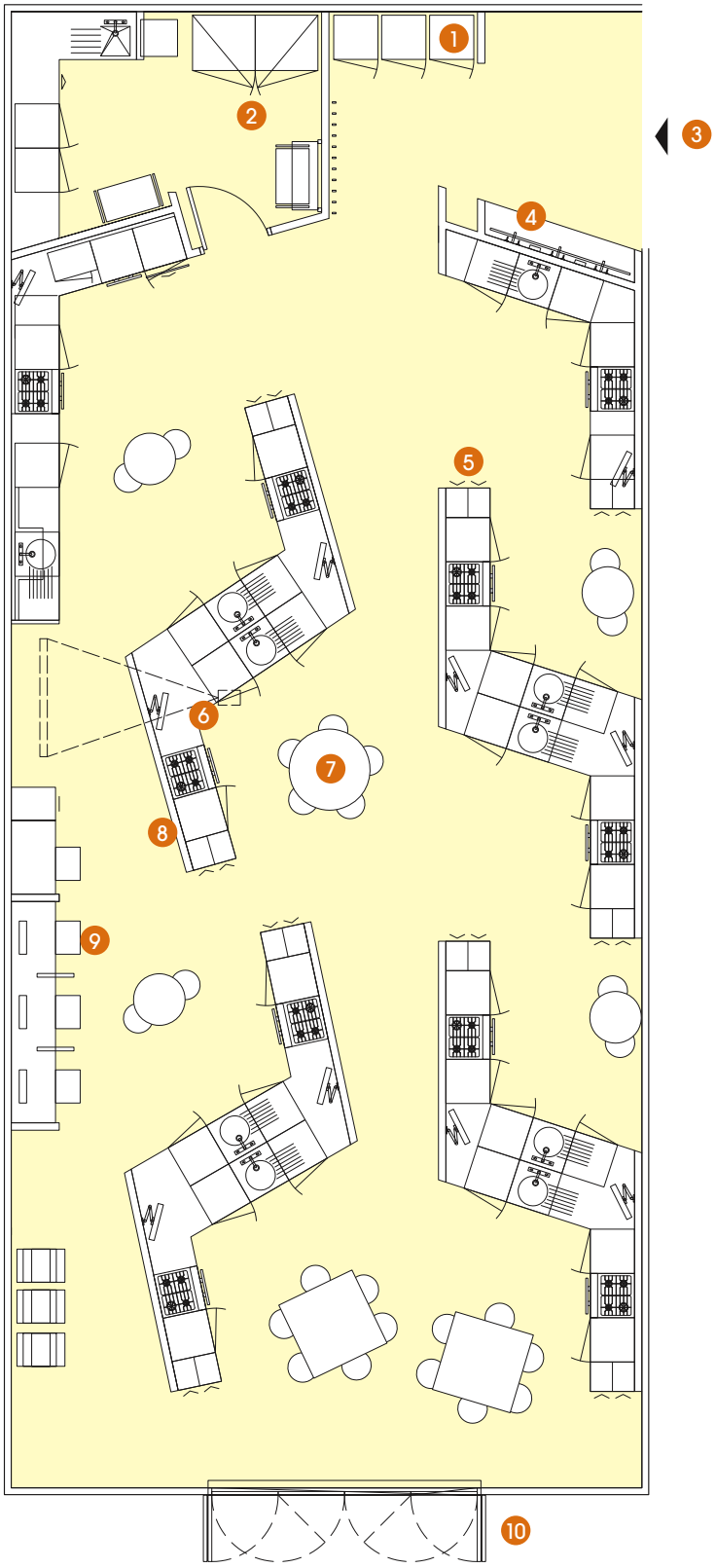
Students wash their hands and swap their coats for aprons in the entrance lobby.

To create the free-flowing space the school wanted, the architects used a series of angled serviced units that combine the spatial efficiency of peninsular workbenches with the accessibility of island units. There is room between units for students to work in a variety of group formations.

The space is designed to maximise visibility. Students can see teachers and support staff at all times. Conversely, staff can oversee student activities from anywhere in the room.

The spacious entrance area acts as a preparation lobby, where students swap their coats for aprons and wash their hands. Fridges in this area mean that ingredients and prepared food can be delivered and collected easily. An adjacent preparation and storage room houses clothes and dish-washing facilities.

The space has one adjustable-height work area dedicated to wheelchair users, while all areas of the room are wide enough to accommodate wheelchairs.



1 Fridges
2 Preparation/store
3 Entrance
4 Hand-washing
5 Under-bench recycling bins
6 Integrated ICT
7 Non-practical activity areas
8 Raised back to cooking stations
9 ICT bays
10 Folding doors to allotments

Staff and students have clear sightlines for demonstration and there is enough space between units to have tables for non-practical activities.

Furniture, equipment and ICT

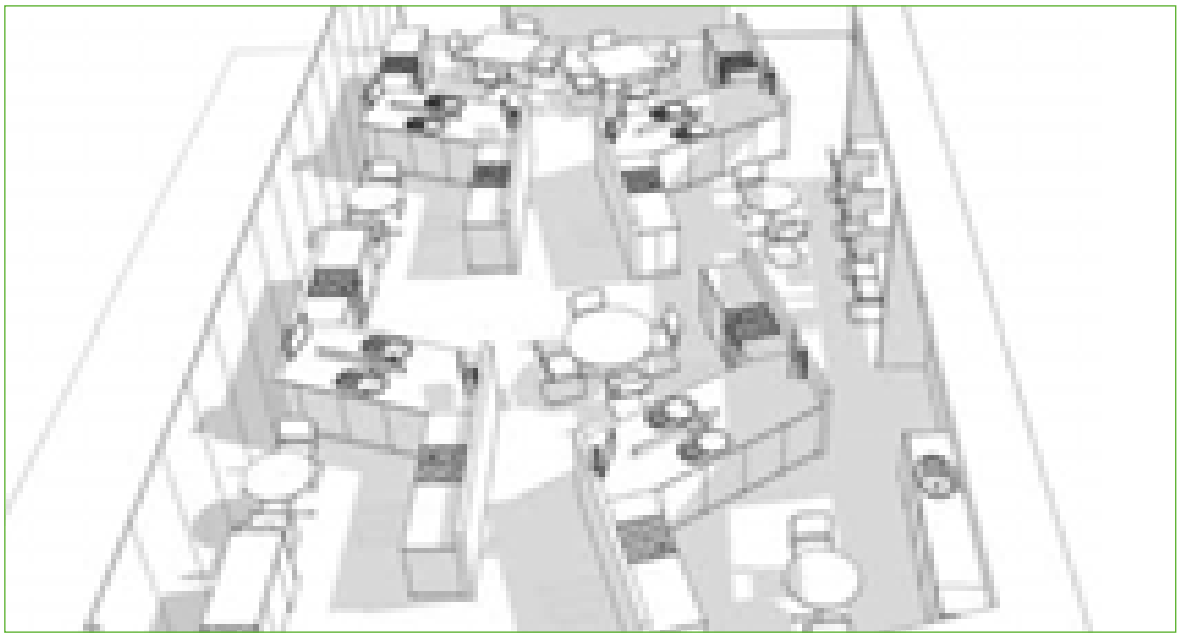
The school believes it is important to keep abreast of changes in technology, as the budget allows. The food technology room has therefore been designed to accommodate ICT-led activities, with technologies like video capture and replay and internet access through mobile devices.

There is a small resource area of fixed PCs, with washable keyboards, screens and mice, and each practical workstation has a washable touch-screen on monitor arms. These could even be replaced by hand-held devices or, as suggested by the students, displays could be projected onto the work surfaces.

Although any workbench can be used for demonstration, one island workspace has a ceiling-mounted video camera linked to a wall-mounted interactive whiteboard. Students can view presentations and demonstrations on-line elsewhere in the school or at home, along with menus and other learning materials. Following the theme of technology-assisted delivery, there is space for the teacher to talk students through ICT work alongside the interactive whiteboard.

Each workspace has equipment storage close by. Larger electrical items, such as food processors, are stored on mobile trolleys. The workspaces are designed for two students to share a cooker and hob unit, a fridge and a sink. The cooking equipment is split 50/50 between gas and electric so that students get experience of both.

The design team proposed durable polymer work surfaces, which can be constructed as a continuous top to emphasise the flowing shape of the units.



Raised backs on each workstation support computer screens, so students can access ICT presentations during practical activity.

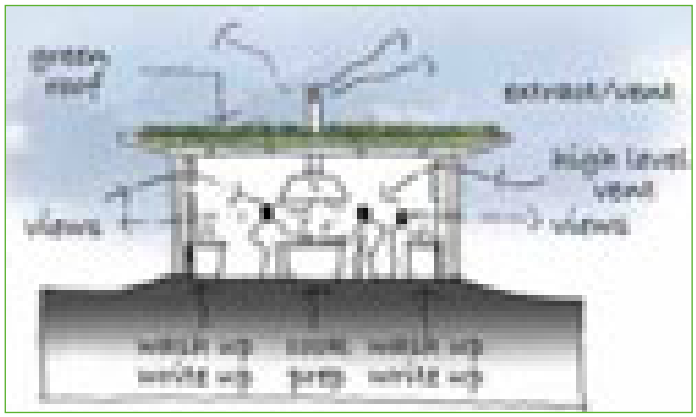
Environmental design and sustainability

DEGW's design proposals reflect the school's approach to sustainability by reducing energy use and waste.

The structure is timber. The narrow plan gives good levels of daylight and allows natural rather than mechanical ventilation, where possible.

An extensive green roof (growing self-sustaining sedum on a very thin layer of soil) reduces heating and cooling requirements by improving the roof insulation. The roof also improves sound insulation for the building – the soil helps to block lower frequencies and the plants block higher frequencies. It will increase wildlife habitat and will also improve the life expectancy of the roof by protecting it from sunlight.

The designers proposed rainwater harvesting from the roof, with a pond to store water before it is used for irrigation, and sought to retain 'grey water' (from sinks and hand basins) for flushing WCs. They also provided recycling bins at both ends of each workbench, separating out glass, food and paper waste. This makes it easy for students to deal with waste effectively – and it can be integrated into the school-wide recycling initiative.



Sustainability was factored in at an early stage in the design process.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £393,000 (Q4 2009). This higher figure reflects the school and local authority (LA) decision to enhance and enlarge the facility so that it is easier to open up for community use. The LA provided extra funds to pay for this.

Key points

- **After-school community use may require an enhanced specification – check that the budget is available to provide it.**
- **Choosing natural materials with low 'embodied energy', like wood, can lock up carbon instead of raising climate change emissions.**
- **Consultation is more than just asking staff and students for feedback on designs – it's an opportunity to turn the school's vision and learning strategy into clear design concepts.**

Fordwater School

Number of students:	Local authority:	Age range:	Architect:
101	**West Sussex**	**2-19**	**cube_design**

Context

Fordwater School is a co-educational school for students with severe learning difficulties and disabilities. The school has a specialist curriculum designed to meet these needs.

All the school buildings are single storey and date from the late '60s, with various extensions added up until 2003. The grounds are relatively level and surrounded by mature trees, with high quality landscaping and external seating areas and terraces for each classroom. Play is an important part of school life and specific areas are used for different games activities.

There is currently no dedicated food technology in the curriculum and students have to cook in their classrooms using a mobile cookery trolley. The staff work hard to maximise sensory experiences.

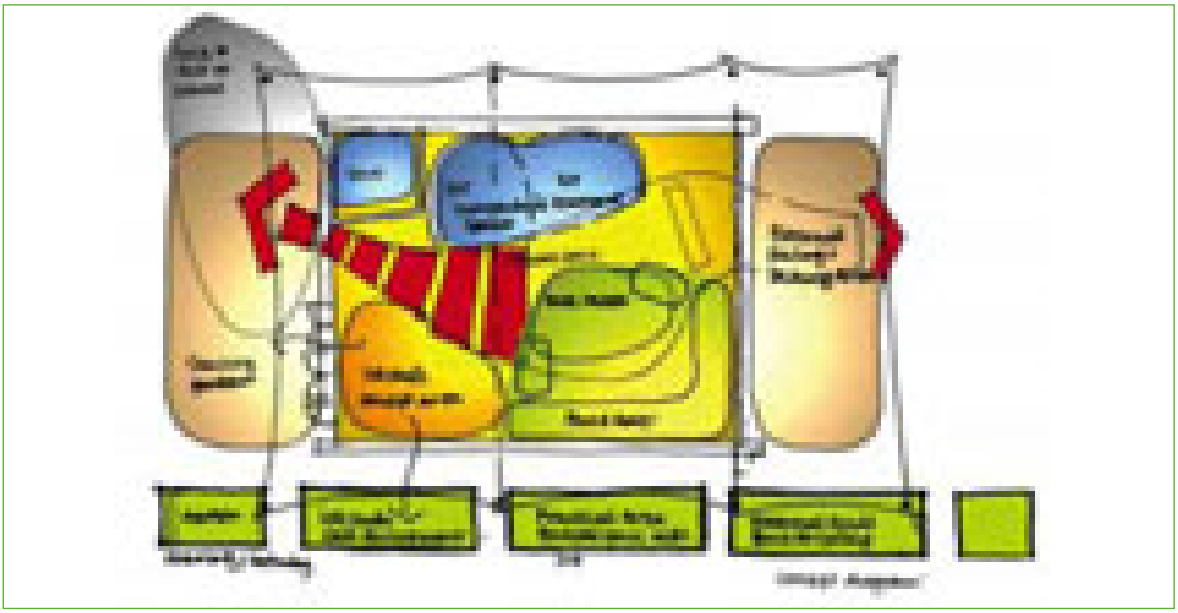
Developing the vision

Fordwater School places a good deal of emphasis on teaching domestic life skills and encourages social interaction. Healthy eating is a strong focus of the curriculum, enabling pupils to make informed choices. The school was keen that the food technology room should support this.

Student needs vary enormously, including both physical disabilities and learning difficulties. Many of the students use wheelchairs, for example, and need room to manoeuvre. The balance of needs changes too, as cohorts come and go. Flexibility, therefore, was a key part of the vision, allowing teachers and teaching assistants to provide the right support for individual students. Sensory experience at every stage of the cooking and eating process was felt to be crucial.

Providing ICT facilities was also important, as ICT is a thread that runs throughout the school and a vital tool for supporting students' learning. The school and designers envisaged an ICT-rich, versatile space, with touch screens and sensory screens (allowing students to 'feel' images on the screen). One of the main drivers was learning in comfort – bearing in mind that some students might be on the floor or in wheelchairs.

The school also wanted staff and pupils to be able to sit together, both in exterior and interior spaces.



This early concept sketch takes on board the school's desire for clearly defined practical and life skill zones, as well as an overarching need for flexibility.

The way forward

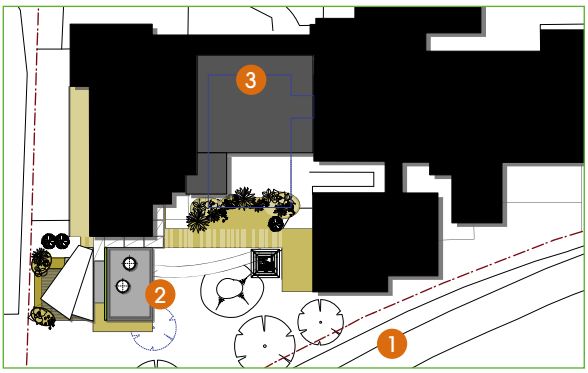
Location

The designers and school assessed one location close to a proposed hydrotherapy unit and two others to the north, near the main hall.

It was finally decided that the new food technology room would be a single storey structure, with a south-facing terrace and a link to the sixth form block.

They chose this location for three reasons. It:

- **is near an under-used open area – where there is potential to develop a growing area**
- **does not affect play areas or areas used by students as social space**
- **is close to essential services – drainage and power – and next to a plant room.**



1 Main road

2 New block

3 Proposed hydrotherapy pool

The school and its designers looked at the pros and cons of three different locations before making their final decision.

Involving staff and students

The students' learning difficulties mean that it was very important for the architects to understand their particular needs and to be sensitive about how to involve students in the design process.

The architects met teachers, governors and the LA and spent a day in the school observing different activities. This led them to understand that a variety of teaching and learning methods are used with these students, highlighting the need for a versatile cooking space. They developed an understanding of the students' wishes for their new space too, and saw the difficulties many of the students face in taking part in practical activities.

The architects also talked to the school, the LA and the architect working with them about the school's strategic plan to ensure the new cooking space could be integrated into the school's long-term plans.

The designs

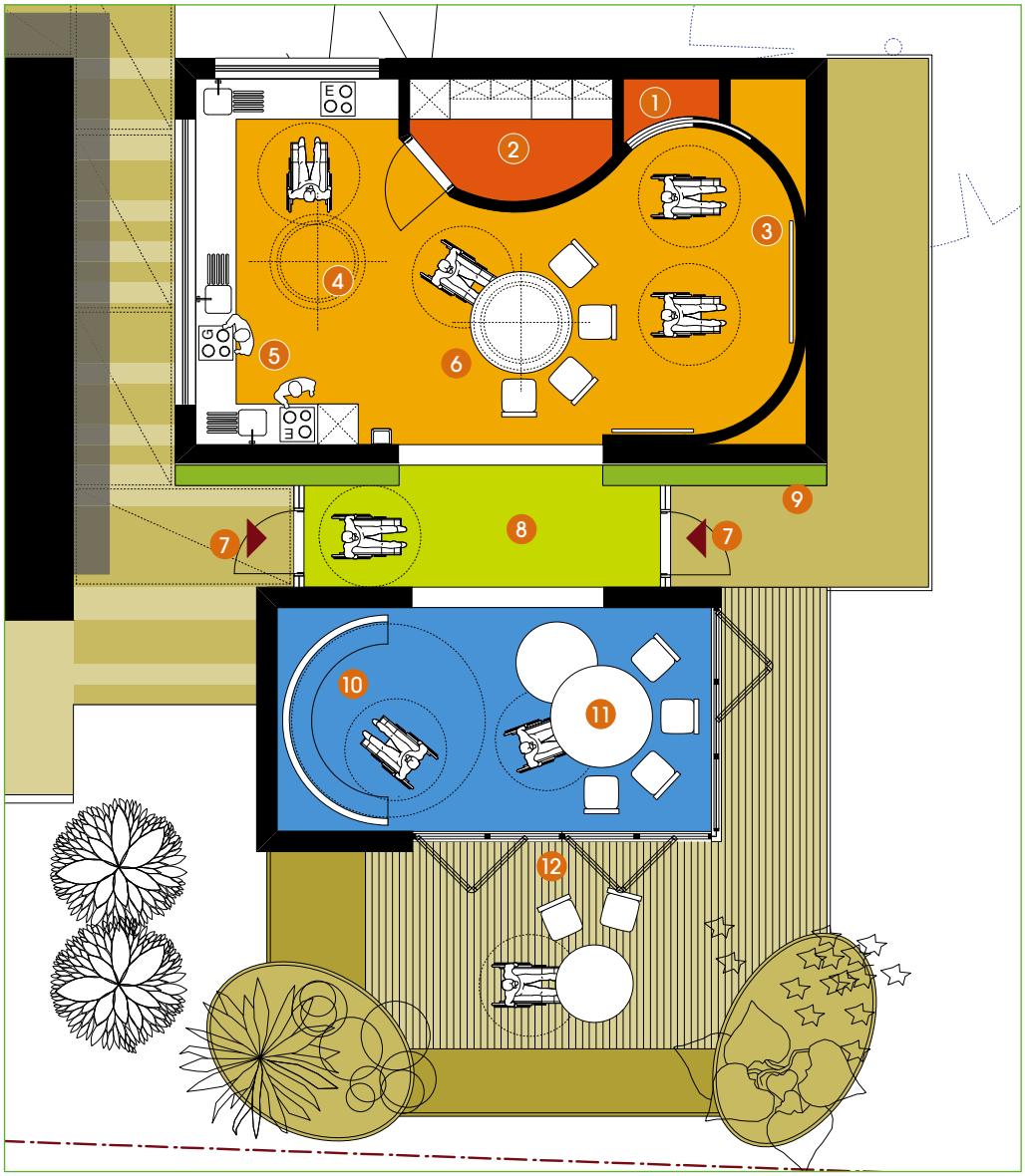
The design team concluded that a pavilion, split in two by a central 'sensory' corridor, was the ideal solution. On one side of the corridor is a 'living wall', with plants growing up it at all levels for students to see, touch and smell. The opposite wall is for students and staff to display student work and learning resources.

The practical and ICT space on one side of the corridor has room for up to five students at any one time. There is a large central table for food preparation and three cookers (two electric and one gas) along the perimeter, to provide a range of cooking experiences. One of the two ovens is at wheelchair height, making it easier for students to see what is happening, and all the furniture is height adjustable. There is a fridge and storage for utensils and equipment.

Leading on from the practical area is an ICT zone with touch screens. Blinds on the windows mean it can be used as a dark sensory space.

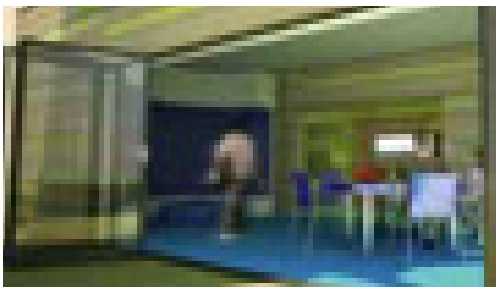
The school wanted the ceiling to be visually stimulating, as some pupils may be restricted to lying positions for some of the time. The rooms are versatile enough to be used for geography or science teaching.

On the other side of the corridor is a café/chill-out space for social interaction and life skills. This area opens onto the terrace, which is covered by a tensile fabric canopy.

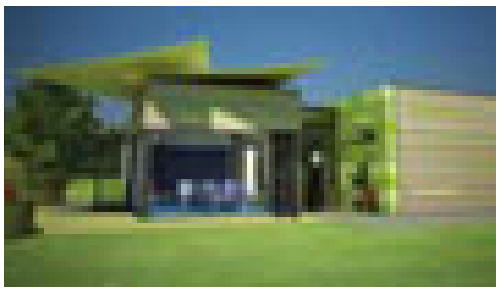


1 Store
2 Preparation room
3 ICT/plasma screen
4 Light well
5 Practical area
6 Food preparation table
7 Entrances
8 Sensory corridor
9 Green wall
10 Chill-out space
11 Café area
12 Hinged, sliding doors to external area

Two spaces, one for practical and ICT work and one for learning life skills and 'chilling out', are linked by a sensory corridor.



Hinged, sliding doors allow the external space to act as an extra café area.



A canopy provides partial shade to the outdoor café area.

Furniture, equipment and ICT

ICT is totally integrated, with wireless connections, allowing laptops to be used in the main rooms, the corridor and outside. The dedicated ICT area has a plasma screen, which can act as a projection wall that can be viewed from a very wide angle – 180°.

The furniture in the cooking area is fixed for the practical area but movable in other areas to allow the space to respond to changing teaching methods and the varying needs of the students.

Curved screens not only help create a calm and secure environment, but also provide seating and ICT projection.

Environmental design and sustainability

The proposed new building is clad in larch and has high insulation values. The green wall also provides good insulation.

An even temperature is an important consideration for these vulnerable students. Underfloor heating is planned, since some students need to sit at low level or on the floor itself.

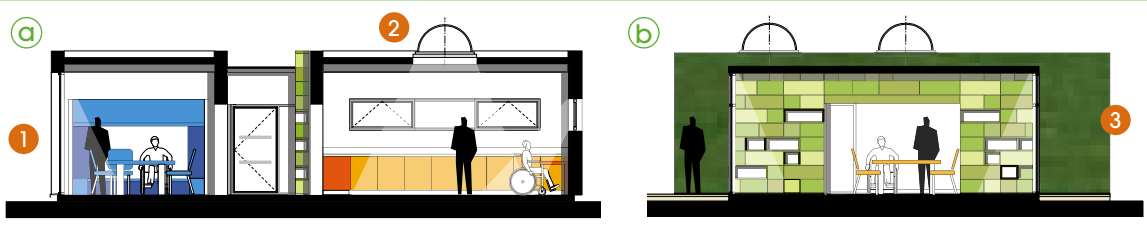
The design prevents build-up of heat from the perimeter windows, using opening windows to allow cross-ventilation and integral blinds to minimise the solar heat gain. The doors to the terrace also open fully and extract fans will be located above the cookers. Windows in the roof provide daylight to the interior.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £284,000 (Q4 2009).

Key points

- **Ensure flexibility – schools for students with special educational needs (SEN) need to provide a food technology room flexible enough to accommodate a wide range of teaching styles and requirements.**
- **Allow students of all ages and abilities to learn other life skills as well as about cooking and eating.**
- **Use opportunities to incorporate sensory experiences into the learning environment – especially for students with visual impairment.**
- **Consider each individual student's perspective – for example, some may spend time lying down looking at the ceiling.**



1 Full height glazing allows good natural light

2 Light wells

3 Green wall provides insulation

Cross-section through the two main areas either side of a sensory corridor (a) and long section through the sensory corridor looking towards the practical/ICT space (b).

John Hampden Grammar School

Number of students:	Local authority:	Age range:	Architect:
1,020	Buckinghamshire	11-18	DEGW

Context

John Hampden is a boys' grammar school in suburban Buckinghamshire. The school's buildings are predominantly mid-1960s, brick, and with two additions from the mid-'90s.

The school currently has arrangements to use the cooking facilities at nearby Wycombe High School for Girls for after-hours lessons.

Developing the vision

Reflecting its Green Flag status, the school was keen for the new food technology room to be sustainable and have a low environmental impact.

The room needed to accommodate groups of 20 students. The school also wanted to use the new room to engage with the local community, including offering University of the Third Age courses for older people.

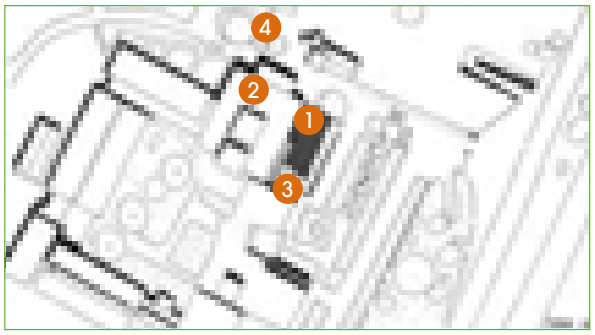
Functionality and purpose were to be prioritised rather than eye-catching or 'flashy' design motifs.

The way forward

Location

After evaluation by the LA, it was clear that the current school buildings offered no options for refurbishment, so a new build was proposed.

As food technology will be part of the D&T department and managed by its staff, the school felt that the new building should be close to the existing design block for easy access and curriculum links. The designers found a location at the front of the school, with direct access both to the existing D&T spaces and the ICT room.



1 New building

2 Existing D&T block

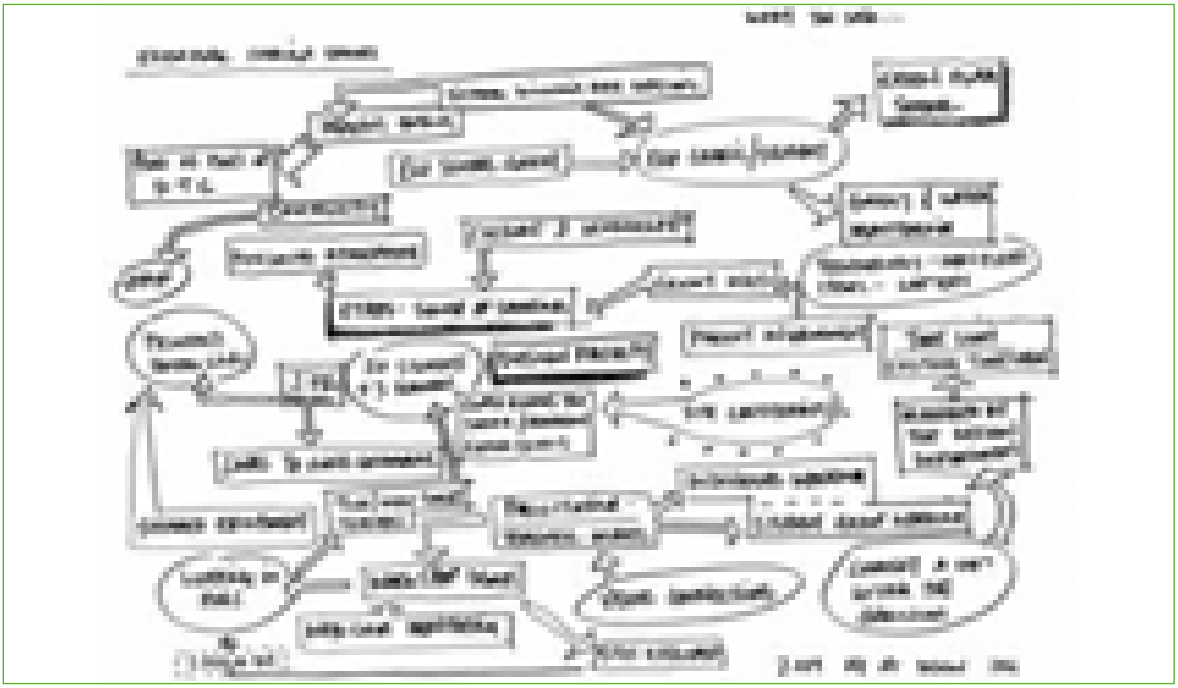
3 New landscaping

4 Proposed allotments

The food technology room is located next to the D&T block.

Involving staff and students

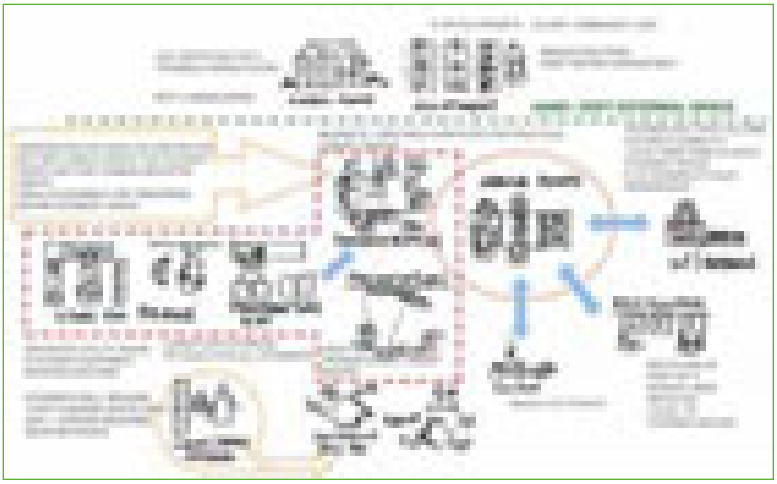
Teachers, students, senior staff and LA representatives worked with the designers in small groups to explore the aspirations and constraints for the new room and define a brief.



The designers made this visual record of the school's objectives, based on workshops with staff and students.

Analysis of its teaching approach showed that the school uses a 'facilitating teacher' model – where students work individually and in groups but have significant control over their own learning. Students need room to see and give food demonstrations, with good visual connections between each other, as well as good supervision by teaching staff.

Staff and students agreed that they wanted the new room to feel light and airy. They also wanted the exterior to make a bold statement.



The designers worked with the school to establish the settings for each activity before designing the whole space.

The designs

The school was keen to arrange workstations as a combination of island and peninsular layouts. This gives a variety of settings and allows demonstrations from different parts of the room, which reduces the emphasis on a single, dedicated area for the teacher.

Generous spacing between units means that students can move about freely and have easy access to equipment and resources, including in under-bench cupboards. To avoid congestion, the two hand-washing sinks are at opposite ends of the room.

Near the entrance there is a lockable room with storage space and a preparation area, where students can leave their ingredients in fridges without disturbing classes in progress. Putting the washing machines and dryers here keeps their noise and heat separate from the main practical space.

Large items like electric food mixers are stored on trolleys that can be moved from the storage and preparation area into the main food technology room.

The design also includes a 'feature wall', where the school can introduce its own branding to the room. This could be based on quotes from famous chefs or other inspirational personalities for students.

There are also magnetic, writable surfaces on some of the other walls, so that staff and students can use them to record important points during practical and theory work. Alternatively, they may use them to post up recipes or other learning materials they need, out of the way of food and spills.

The design encourages a sense of ownership: a full length 'feature wall' gives ample and flexible display space for staff and students to add their own material.

1 Entrance
2 Storage and preparation area
3 Coats and bags store
4 Run of benching for wheelchair users
5 Island unit and possible demonstration area
6 Existing D&T department
7 'Feature' wall
8 Extraction hood
9 ICT area
10 Peninsula unit
11 Under-counter recycling bins
12 Hand-washing sink
13 Lockable display unit
14 Recycling bins

A combination of island and peninsular units allows a variety of ways of working. Demonstrations can be given from different positions.

Furniture, equipment and ICT

The design team opted for Corian (a plastics product, available in different colours and with or without patterns) worktops for ease of cleaning and durability. Rubber flooring and an acoustic treatment on the ceiling and walls help to absorb noise.

Desktops at the ends of the island and peninsular units are lower than the food preparation worktops and have space below so that students can put their legs under the desks and sit at them in comfort. They are fitted with data and power connections to make it easy to use laptops or other portable ICT equipment. The school wanted to avoid desktop computers, which would have prevented the space being used for anything else.

There is a dedicated ICT work area with storage for books or equipment and a larger dedicated ICT room in the D&T block nearby.

The D&T department at the school are enthusiastic users of video in classes. The new facility means that students can view recorded demos on-line in the ICT area during class without distracting or obstructing those preparing food – or study them later in school or at home.

There is a video camera above each workstation in the food technology room, allowing video projections onto a height-adjustable smart-board on the wall. This means that any work area can be used for demonstrations and to prepare on-line videos for review and evaluation exercises.

Also above each workstation is an air extraction and lighting unit, integrated into a single drum-shaped fixture. Movable spotlights draw attention to student displays, which can be mounted in various places.

Designers included details like a slot in the worktop to take recipe stands and adjustable lighting to highlight the feature wall.

Environmental design and sustainability

As an Eco-School with Green Flag status (see References, p76), John Hampden Grammar has ongoing commitments to sustainability, including waste management, which the food technology room will make it easier to meet.

The design uses an external timber frame structure, which is both fast and economical to construct, as well as requiring very little processing energy to manufacture. The timber also helps to lock up carbon dioxide, contributing to the reduction of climate change emissions.

High-level glazing and opening windows allow for some natural cross-ventilation cooling, giving staff and students comfort control. In addition, an oversized roof helps to reduce the solar heat gain in summer and provides some shade against glare from low-level winter sun.

Nevertheless, the designers feel that some mechanical cooling will be necessary for the practical cooking area, especially in summer.

To support good waste management practices, there are dedicated bays for recycling close to the secondary entrance. There are also bins under the counters to collect and sort materials for recycling. Other proposals include a rainwater butt fed from the roof to collect water for growing vegetables.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £344,500 (Q4 2009). Additional costs are expected for new plant for cooling and ventilation, since the existing plant may not be able to service the new building.

Key points

- **Bear in mind all factors when choosing the location – there may have to be a compromise between proximity to D&T and the best access to the facility. (However, some schools prefer not to site food technology close to the rest of D&T.)**
- **Consider movement and flow – the entrance area here allows 20 or more students to hang their coats and collect aprons before entering the practical area.**
- **Clear briefing and good communication between school and designers are critical.**
- **It is important to consider settings at the briefing stage to establish what furniture, equipment and services will be needed for the activities planned.**
- **Be imaginative in the way walls are used – for example, as writable surfaces.**

Kelsey Park Sports College

Number of students:	Local authority:	Age range:	Architect:
960	**London Borough of Bromley**	**11-18**	**dRMM**

Context

Kelsey Park all boys school is a specialist sports college. Its 1960s buildings are system-built structures in need of substantial refurbishment – and indeed, a major refurbishment is planned for the future.

The school is committed to teaching and learning about healthy living in an holistic way, linking healthy eating with PE and sport. Students currently learn about nutrition and they grow vegetables in an allotment and greenhouses. The new facility will develop this commitment further.

Developing the vision

The brief to architects was simple: to provide a facility for 18-20 students to study food technology, with a strong emphasis on practical experience and a link to D&T. Conscious of students' limited food technology experience and the need to prepare them for adulthood, the school wanted the food technology room to reflect a catering environment rather than echoing domestic styles, since this was thought more likely to inspire and motivate the boys. They wanted the area to be free from stools or chairs, and ideally include space for demonstrations away from the main practical area.

Durability was an important prerequisite because the head teacher expects high usage and knows that an all-male cohort will need robust furniture and equipment.

The way forward

Location

Architects dRMM worked with the school to consider options for both new build and remodelling. Kelsey Park originally intended to build a new, standalone facility and had identified a potential location. They also explored the design and technology department as a suitable location but discounted this because these spaces are likely to be replaced if the refurbishment project goes ahead.

The final decision was to remodel an existing drama space in the heart of the school. Next to the drama area is the school dining room. Formerly a courtyard but now covered with a glazed roof, it offers potential for a restaurant-style space for commercial catering students (although the dining room is used for breakfasts and two lunch sittings). This location also has the advantage that it is well serviced with gas and electricity and next to the boiler room.

The building itself is sound and will not be affected by the refurbishment project. Drama will be re-housed in the proposed building programme.

Offices currently located across the corridor from the drama space could allow for future expansion of the food technology area within the planned refurbishment.

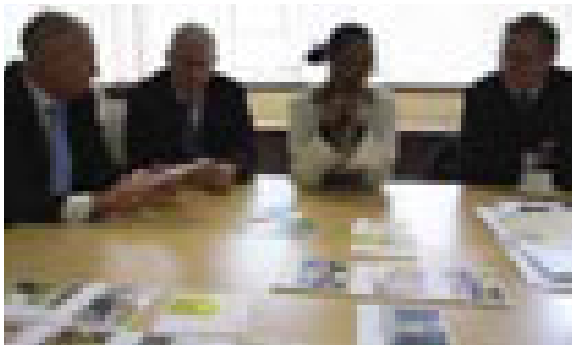
1 Main hall
2 Dining room
3 Main kitchen
4 Flexible dining
5 Food technology room

Adapting an existing room was a sustainable option and meant they could link to the adjoining dining space.

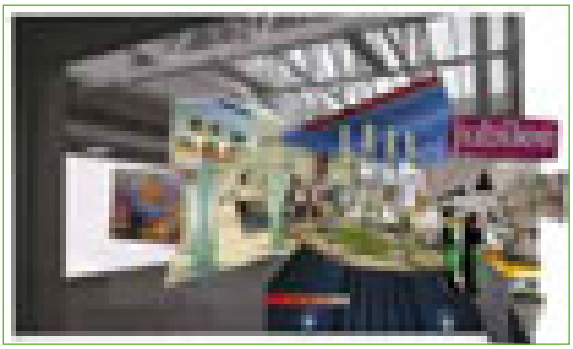
Involving staff and students

The architects organised workshops with students and staff to establish their aspirations for the new facility. Students worked enthusiastically to create collages to express their ideas. The collages showed their wide interest in food production, cooking and eating, as well as the food environments they enjoy outside school, such as food courts.

The consultation clearly identified the school's wish for students to learn about the whole food production process from 'seed to spoon' and to develop the concept of 'food discovery'. To set the context of the school's aspirations for the transformation of food teaching and learning, the head teacher used the example of students who assume that produce simply comes from the supermarket.



School staff were actively involved in the design process.



Students created collages using magazine images pasted onto photographs of three possible locations on the site.

The designs

Kelsey Park's requirements for practical work away from demonstrations meant that the facility needed to be efficiently planned. The school wanted fixed tiered seating where students could focus not only on the demonstrations but also on their written work.

The design of the central area, where students cook, divides the space into a grid of equally sized workspaces.

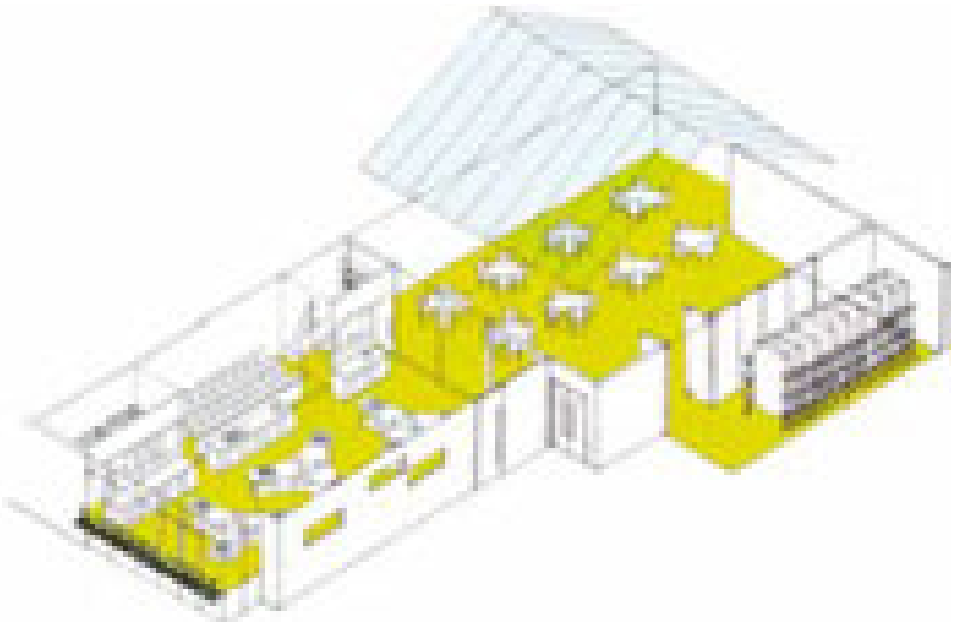
dRMM's approach to planning was straightforward. Fixed preparation worktops and storage run along the two long sides of the rectangular space. Triangular or 'trimerang' units fitted with hobs and sinks – an adaptation of an earlier boomerang design – sit in the centre.

A linear strip of auxiliary accommodation running behind the worktops on one wall includes an office, the demonstration area and a store. An additional store room on the other side of the corridor allows students to drop off and collect their food without interrupting lessons.

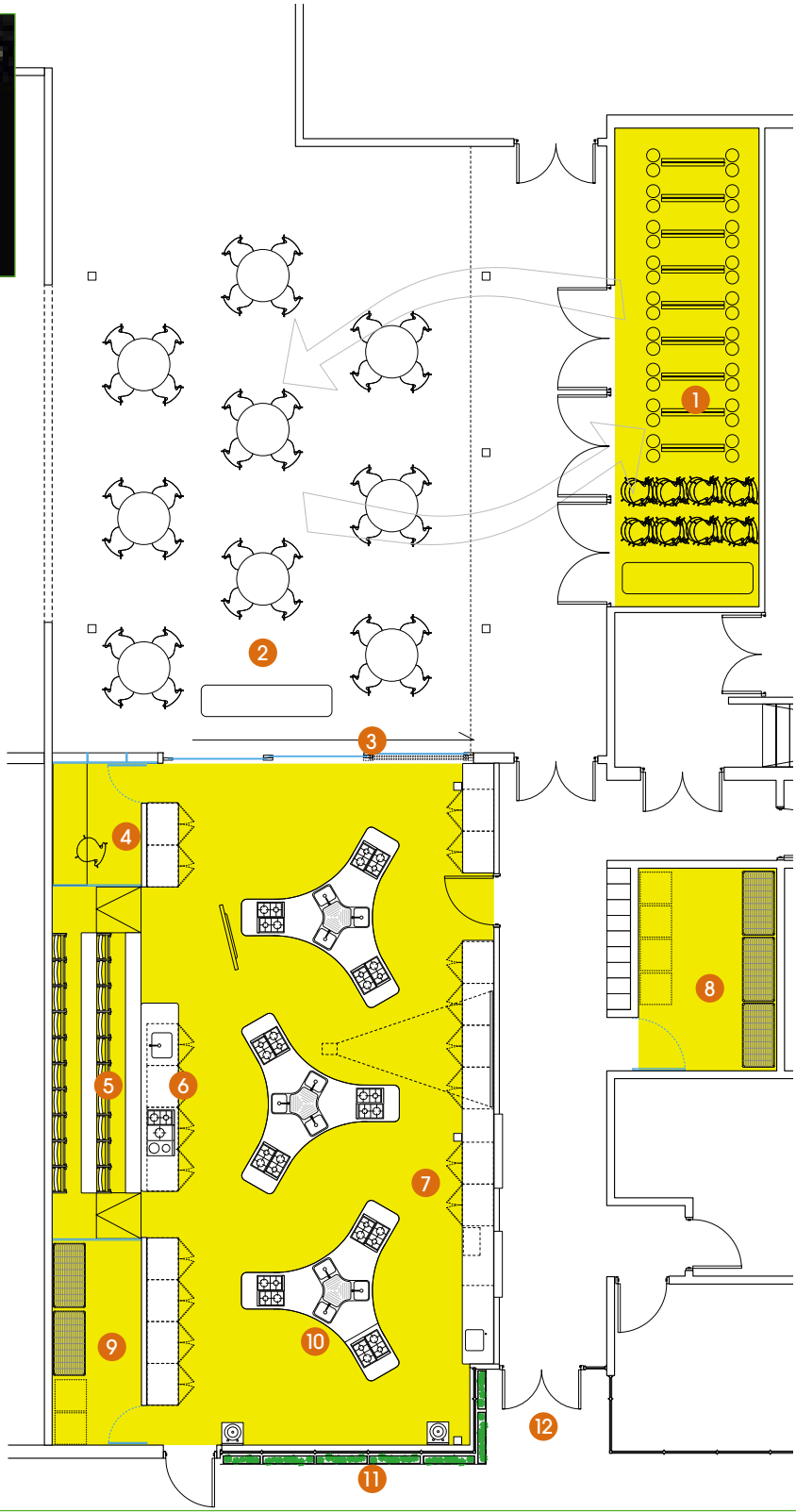
The demonstration area sits between the office and the store, creating a discrete zone so that students can focus on a demonstration without distraction – an advantage which overrode the downside of reduced flexibility.

The food technology room is connected to the dining area by a series of large glass sliding doors. These have graphics on the lower levels to minimise distraction but maintain light and views at high level. During community activities and parents' events (and possibly future catering courses) the doors can be drawn back and a movable counter set up to serve the dining space.

To the side of the room is a linear furniture store, providing storage space both for the existing folding lunch tables and a new range of café seating.



The adjacent dining area will be used in conjunction with the new food technology room by school and community.



1 Storeroom for new café furniture

2 Dining/community café

3 Glass doors linking to café

4 Office

5 Raked seating

6 Demonstration bench with camera above

7 Storage and worksurface

8 Students' storeroom

9 Storeroom

10 'Trimerang' units

11 Herb garden

12 Entrance

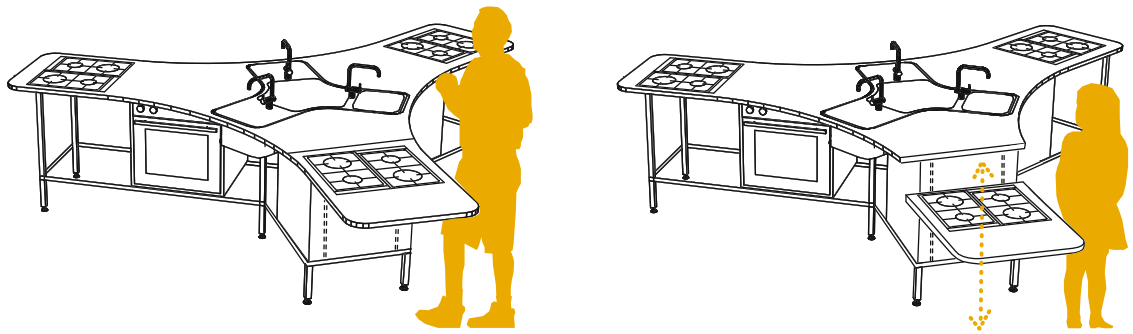
Raked seating means students have a clear view of cookery demonstrations. Distinctive 'trimerang' units (see inset) provide practical facilities for up to six students.

Furniture, equipment and ICT

During consultation the school looked at a number of different materials for the main 'trimerang' worktops and cupboards. Catering standard stainless steel was eventually chosen for its durability, in a room that will sometimes be used for catering.

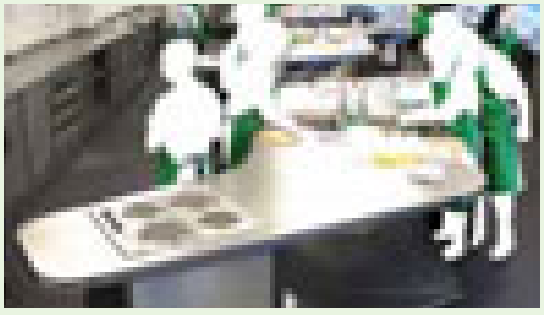
Equipment at Kelsey Park includes high quality domestic gas hobs and fan-assisted ovens, with one eye-level oven for students using wheelchairs. The school and designers considered the pros and cons of gas and electricity and ultimately decided to have all gas appliances for better controllability, with just one induction hob as part of the demonstration area. A bank of microwaves below the counters means there is a full range of appliances.

ICT includes a camera system linked to a screen to display demonstrations. An interactive whiteboard provides large format teaching aids during lessons.



One arm of a 'trimerang' unit is adjustable in height to allow for wheelchair access.

dRMM had installed the original boomerang shaped units in a scheme for Kingsdale School in South London, where the school found the units created an inspirational environment.



Environmental design and sustainability

Adapting an existing space rather than building new reduces the need for new materials and therefore reduces the 'embodied energy' of construction. It also cuts down the amount of construction waste. The building fabric (walls, roof and joinery) of the food technology room are of sufficient quality not to need upgrading during the future remodelling.

The rectangular space is lit naturally at one end and daylighting levels are further increased with the glazed connection into the dining room. The acoustics of the existing space are improved by adding an acoustic ceiling that will provide high levels of sound absorption.

The classroom is naturally ventilated to minimise energy consumption. Opening windows and doors are supplemented by high-level mechanical extracts above the 'trimerangs' that take warm air out through the roof.

Glazing is designed to reduce the need for electric lights, while at the same time reducing solar heat gains. High efficiency lighting with movement controls also ensures that electricity is not wasted when the food technology room is not being used.

Glazed doors to the top-lit dining room help ensure good daylighting levels throughout the food technology space.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £300,000 (Q4 2009), based on the remodeling costs incurred at dRMM's similar work at Kingsdale School (adjusted to allow for inflation).

Key points

- **Review all the possible locations and examine whether it is possible to rework an existing building, rather than assuming there has to be a new building.**
- **Agree the aspirations for the room – what are the teaching and learning objectives? Is the intention to replicate a domestic or a commercial kitchen?**
- **Consider the benefits of having a food technology room next to the dining room – students can serve their food to other students, which could boost their motivation.**
- **Decide how the facility will support community work and extended schools – will it be used for evening classes? Or catering for community events and parents' evenings?**

The King's School

Number of students:	Local authority:	Age range:	Architect:
1,000	Lincolnshire	11-18	cube_design

Context

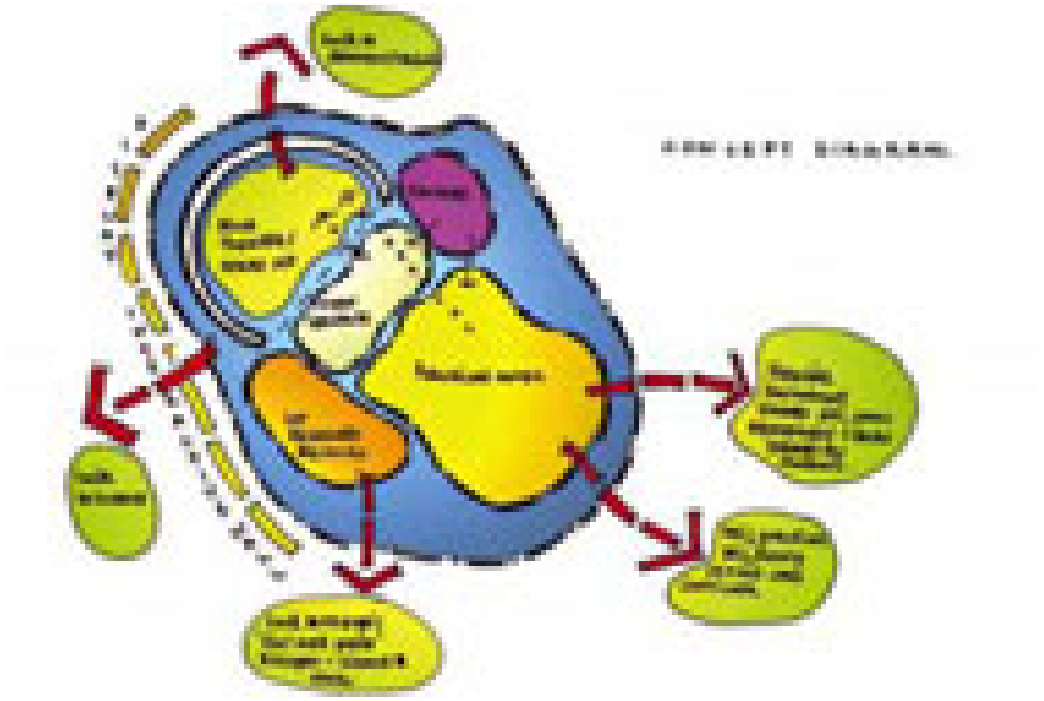
The King's School is an all boys' school on a tight urban site close to the centre of Grantham. Most of the school's buildings are historic and some are listed. There is limited scope for expansion.

Currently there is no provision for food technology or cooking in the curriculum. As a result there are no facilities for cooking within the existing buildings.

Developing the vision

The school wanted to link food technology to D&T since, as a new addition to the school, it was felt that food technology should have strong support from an established department. The location of the food technology room needed to take this into account.

The new cooking space was to be a focal point – to showcase learning about food and catering in the school, and to be a facility available to primary feeder schools, the neighbouring college and the wider community. External and internal seating were also key.



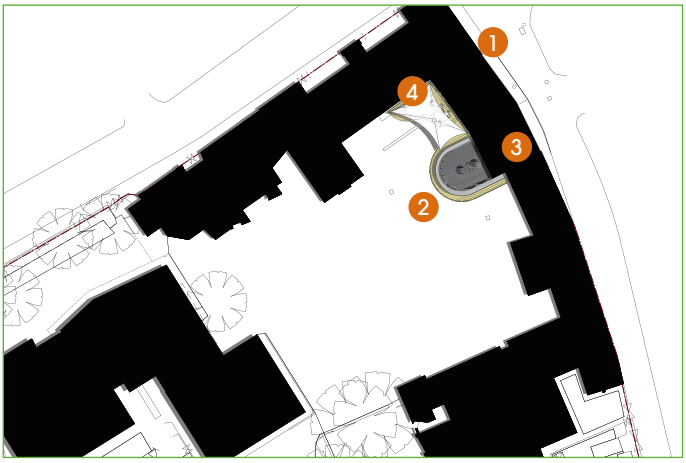
This early concept design takes on board staff and students' vision of the space.

The way forward

Location

The constrained urban site, and the fact that buildings are listed, meant that the location of the new space had to be considered very carefully. Several options were discussed, including converting or extending an existing room, or constructing a new, separate building on the car park.

Eventually it was decided to extend an existing undersized D&T room. This involved building an exciting new addition into the school's quad, which would make a statement for the school and provide a sheltered outside space that could be used as a 'quiet zone' for the students.



1 D&T department

2 New ICT/demo area

3 Remodelled practical area

4 Canopied area

The school was keen to locate the food technology room next to the existing D&T department.

Involving staff and students

The architects worked closely with the students and staff, particularly those in D&T. Students were invited to a series of workshops to brainstorm and assess the approach to the site and the design. They talked about the design of the furniture, as well as the question of using gas hobs versus electric.

The students emphasised that they wanted to capture the excitement of cooking in the new food technology room, creating a sense of theatre. Another important comment from students was that they were interested in business and catering. They wanted to learn how to run a restaurant and to hear from successful chefs.

The designs

The new food technology room is designed to be flexible and adaptable, with practical workspace and demonstration space. The practical area is accommodated within the existing building, with the extension housing the 'food theatre', a semi-circular space with an ICT-rich 'clean' research area and a large demonstration bench.

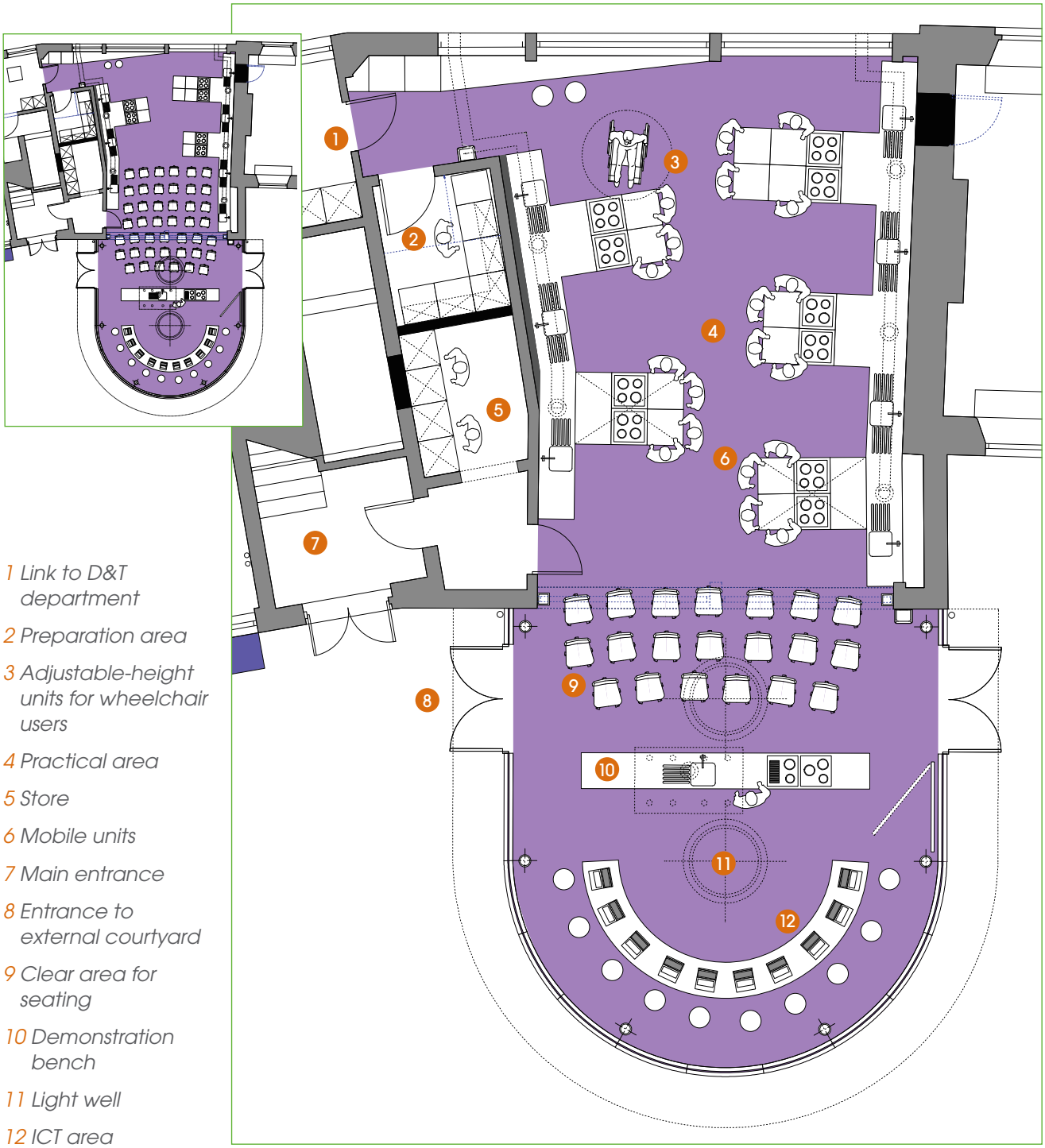
The practical area is designed for 20 students. Students' belongings and ingredients are stored close to the entrance, where there is dry and cold storage for food made by the students. Sharp utensils and staff belongings are at the back of the practical area.

Two of the work units in the practical area can be moved to allow for a larger audience in the demonstration area. This could include parents or people from the local community who use the room outside school hours.

The food theatre has glazed walls, which not only allow views through from the quad to activities inside, but also provide extra daylight. A camera above the demonstration bench is fixed to a mirrored sloping ceiling to ensure good visibility for students.

Outside in the quad, there are plans to incorporate external seating under a covered canopy, accessed from the food technology room or directly from the outdoor play area.

The 'food theatre' projects out from the existing building into a quad. It is a light exhibition space, in contrast to the more enclosed practical area.



1 Link to D&T department
2 Preparation area
3 Adjustable-height units for wheelchair users
4 Practical area
5 Store
6 Mobile units
7 Main entrance
8 Entrance to external courtyard
9 Clear area for seating
10 Demonstration bench
11 Light well
12 ICT area

The remodelled D&T room is for practical activities, with ICT and demonstrations in the new build extension. The school can move two practical units to accommodate a larger audience (see inset).

Furniture, equipment and ICT

The semi-circular ICT bench in the food theatre allows students to work at laptops to download recipes, carry out research and evaluate lesson activities free from the distraction of practical activities. The laptops can be put away when they are not in use. This research area can also be used for other subjects. A wireless network lets students use ICT throughout the room.

The camera suspended from the ceiling at the demonstration desk means that lessons (with a live feed or downloaded from the school's website) can be viewed by students elsewhere in the school or at home.

Above the demonstration bench are a camera to record events and a mirror that gives students a good view.

Environmental design and sustainability

The new build elements are well insulated, with low u-values (a measure of the insulation performance). Integral window blinds close automatically when it is sunny, thus helping to prevent overheating.

The room is naturally ventilated using 'Windcatchers' above the ovens. Extract fans built into the Windcatchers boost extraction if necessary. Windows at either end of the room provide cross-ventilation.

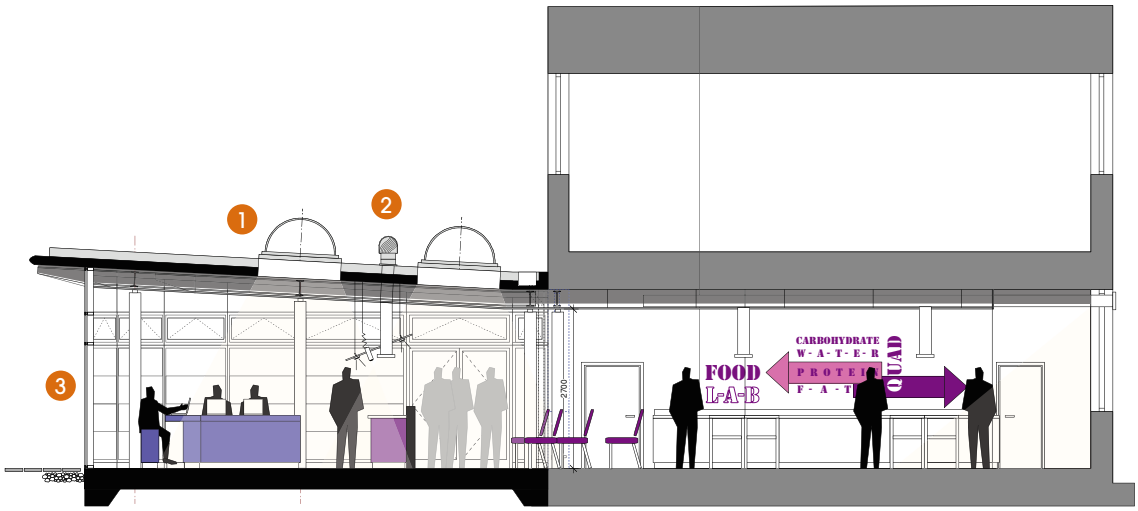
Heating is mainly by radiators but with underfloor heating in the new build food theatre. This avoids the need for vertical radiators along the perimeter, which would obscure the glass from inside and out.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £265,000 (Q4 2009).

Key points

- **Although historic buildings have to be handled sensitively, it is still possible to make a design statement.**
- **Consider using the expressive and dramatic nature of cooking as a way to engage students.**
- **Provide a flexible working environment so that the teacher can vary the format of classes, using demonstration, ICT and role-play.**
- **Think about using external space for purposes other than gardening.**



1 Light well
2 Windcatcher with inbuilt extract fan
3 Automatically controlled window blinds

These environmental features ensure a well lit and well ventilated food technology room.

The Latimer Arts College

Number of students:	Local authority:	Age range:	Architect:
1,250	Northamptonshire	11-18	dRMM

Context

The Latimer Arts College is a large mixed school built mainly in the 1960s, with some later additions. It is on a suburban site with considerable open land.

The school is a keen champion of healthy eating – students learn about its nutritional benefits and grow vegetables in greenhouses. There is currently no provision for teaching food technology but the school was already investigating the possibility of building a food technology room and welcomed the opportunity to explore new design ideas.

Developing the vision

The school wanted an innovative food technology room which would engage and inspire groups of up to 24 students. Durability was an important requirement in view of the high usage of the facilities.

Practical cooking experience is valued highly at Latimer and, as a fully inclusive school, staff emphasised the importance of having at least one workspace in the new facility specifically designated for students with physical impairments.

They also wanted to separate written from practical work and be able to keep chairs or stools away from the practical area.

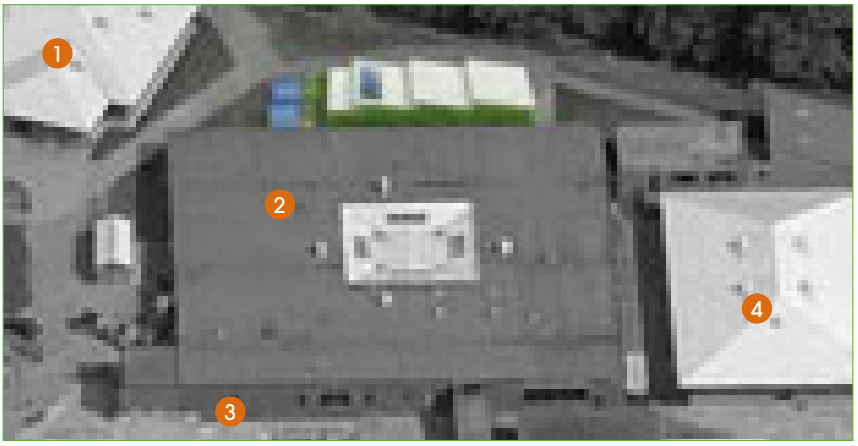
The way forward

Location

The architects began by testing the possibility of transforming one of the existing D&T rooms into a food technology room.

However, the school preferred a new purpose-built facility, since remodelling one room and building a new technology room as well would have been too expensive. A linear site was identified to the north of the D&T department as the best location.

The new block would extend the school buildings up to the boundary fence. The building would be prefabricated, which would minimise disruption on site and allow it to be moved to another area of the site if required in the future.



1 Sixth form centre

2 D&T department

3 Main school entrance

4 English department

The linear building suits the shape of the site, which was chosen to allow links to existing D&T facilities.

Involving staff and students

Alongside discussions with teaching staff, the architects organised a workshop session with students of varying ages to establish their aspirations for the new food technology room. Large posters with black and white images were used as backdrops for students to create their own collages, using photographs and text from magazines to express their ideas for the new room. Their results showed an interest in food production as well as cooking and eating. Some described scientific approaches to the preparation and presentation of food.

The collage exercise was a great success and provided inspiration for the architects – as well as being invaluable in sparking the students' interest in the project.

This is one of the collages created by students in the workshops. It shows an interest in comfortable cooking facilities, stylish furniture, vibrant colours and plenty of daylight, as well as in making links between food technology and science.

The designs

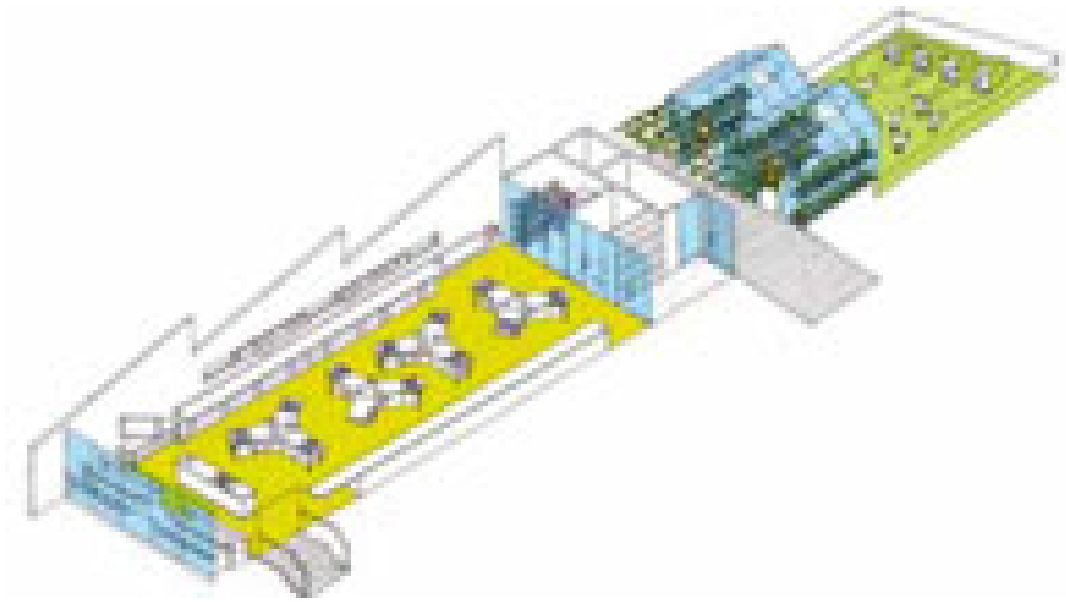
The new food technology room is a linear building which follows the journey of food 'from seed to spoon'. The south-facing wall was conceived as a 'vertical garden', with plants, fruit and vegetables growing up the wall.

Students enter the space via a vine-covered deck, leaving their coats and bags in the lobby outside the room. They can drop off and pick up their food from the storage area without having to enter the central practical area.

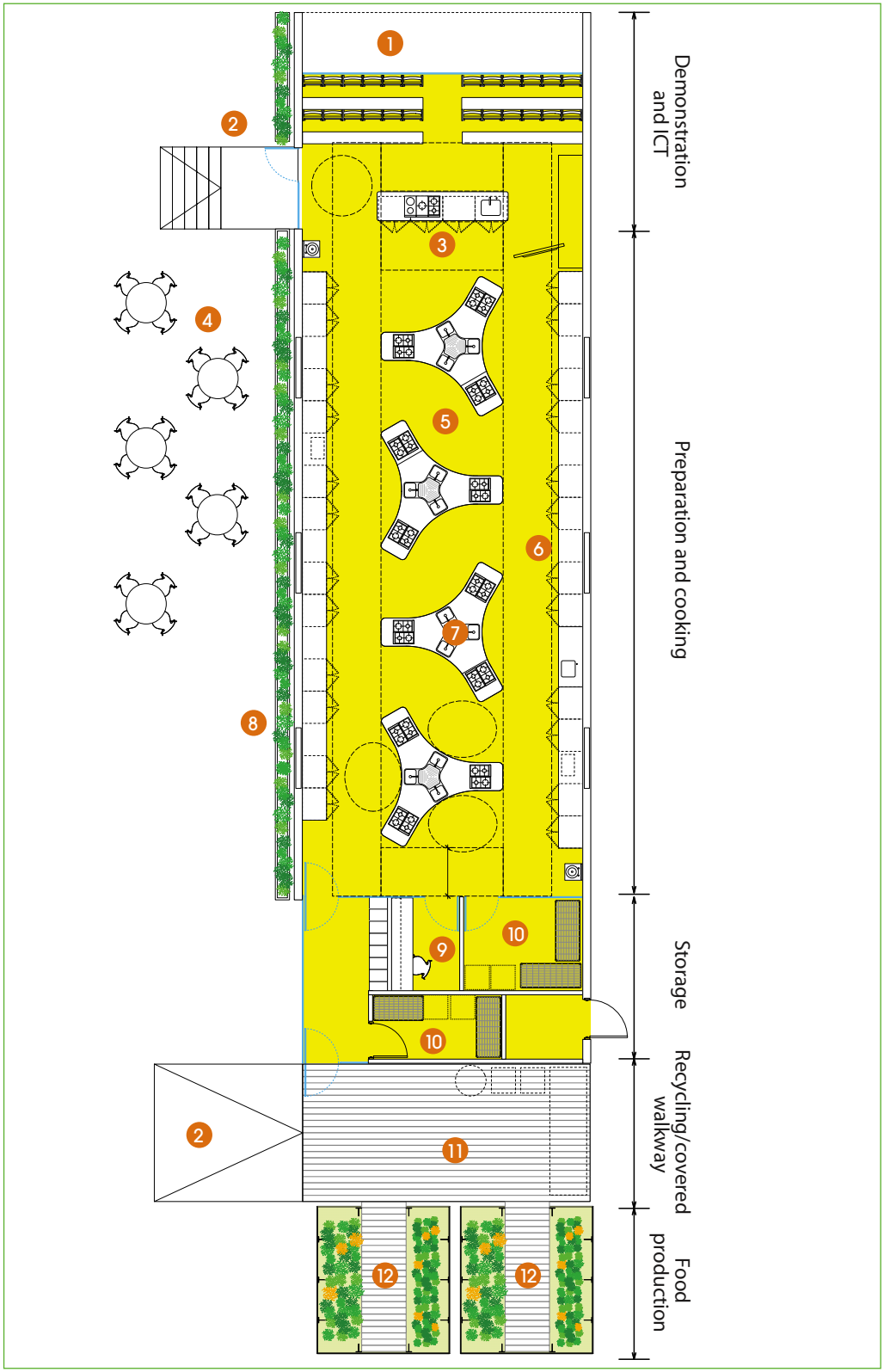
The practical area itself is designed as a grid, with storage on both external walls and practical workstations in the middle. The long, narrow plan gives students easy access to the perimeter storage and good supervision by the teacher. Imaginative bespoke 'trimerang' worktops divide the space up evenly, so maximising the amount of space available. Each workspace has a cooker with two gas hobs, allowing six students to use each island unit. Microwaves below the counters give them the option of using alternative appliances. One of the units is height adjustable to improve accessibility for disabled students.

The demonstration area at the far end of the room has tiered seating facing a demonstration bench. Students can sit comfortably to watch demos, both live and pre-recorded, before moving to the practical area. Because there is a separate seating area, there is no need for stools in the practical area.

The school's existing greenhouses are expanded and linked to the new food technology room via the vine-covered entrance deck, which houses a rainwater butt and recycling bins. Chickens could be introduced to provide eggs – another way to inspire and teach students about food production.



This three-dimensional sketch shows the different activity zones, from the demonstration area at one end to the chicken coops at the other.



1 Raked seating
2 Entrance
3 Demonstration bench
4 Outdoor café
5 Main practical area
6 Perimeter storage and benching
7 'Trimerang' units
8 Vertical garden
9 Office
10 Store
11 Covered walkway
12 Greenhouses

The new food technology room is divided into five zones: demonstration and ICT; practical; storage; recycling; and food production.

Furniture, equipment and ICT

A variety of materials was considered for worktops and cupboards but the school decided it preferred the durability of catering grade stainless steel.

A video camera above the demonstration area links to a screen to broadcast and record teachers' demonstrations. The screen rotates for students to watch in the practical area instead of from the tiered seating.

An interactive whiteboard serves as a large format teaching aid during classes. Half of the students can use ICT for research and design in the demo area, while the other half is using perimeter benches for ICT.

View from the practical area to the demonstration zone with glazed wall behind.

Environmental design and sustainability

The food technology room is constructed using prefabricated wooden beams, a system with excellent sustainability credentials, promoted by the architects (timber has low 'embodied energy'). Wood fibre insulation is used throughout, which avoids the toxicity of some insulation products.

An acoustic ceiling provides high levels of sound absorption to balance the fact that hard surfaces such as stainless steel worktops tend to reflect sound and thereby increase noise levels.

Daylighting levels are high and controlled with north-facing skylights, providing diffuse light without the risk of overheating in summer.

The ventilation strategy is to bring fresh air just above the perimeter benches using opening vents. Used air is extracted passively high up, through the rooflights. When necessary, extra air flow will be provided by mechanical ventilation through the high point of the roof.

The building is as energy efficient as possible, with low running and maintenance costs. Rainwater is collected for growing vegetables and aerated taps reduce mains water consumption. All appliances are 'A' rated for energy efficiency, and there are solar panels on the roof – partly to educate students about renewable power.

Cost

Based on remodeling costs for work at Kingsdale School, the estimated cost is £193,000 plus furniture and equipment (Q4 2009).

Key points

- **Review all the location options – even if there is already a clear preference, other solutions may bring more benefits.**
- **Consider how the space will be used and what is to be taught. Should it replicate domestic kitchens or catering facilities? Could it be a hybrid of both?**
- **If an unusual workstation design has been specified, try to find out where it has been used before (like the 'trimerangs' here) and get feedback from users.**
- **Hard surfaces are common in cooking facilities but they reflect sound, so acoustics need careful consideration.**
- **Think about separating zones for practical work from zones for research or demonstration.**

1 Solar energy
2 Solar control
3 Ventilation
4 Rainwater collection
5 Water recycling

Long section through the building showing the environmental strategy.

Wrotham School

Number of students:	Local authority:	Age range:	Architect:
740	**Kent**	**11-18**	**cube_design**

Context

Wrotham School is a mixed specialist humanities college on a rural site, with generous playing fields. The existing facilities are not ideal, due to the age and condition of the buildings, and there is a long-term plan to remodel the school.

Although food technology was removed from the curriculum eight years ago, healthy eating and exercise are encouraged.

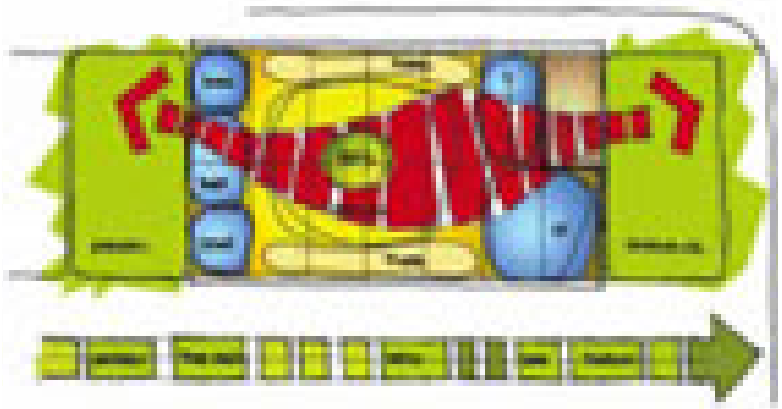
Developing the vision

The school wanted food technology to be independent as well as being part of D&T. Their brief to the architects focused on the 'journey' of food, from growing, through preparation and production, to eating, with a garden for growing vegetables. They also wanted to promote curriculum and physical links to other departments, such as ICT and science. Demonstration was highlighted as a key element of the design.

The vision focused on engaging and inspiring students. For example, the school plans to give awards to students who develop recipes good enough to be served in the school dining hall as 'student specials'. The design needed to find creative ways for students to display their produce.

The school wanted a building which would be a statement of the school's progressive outlook. It also had to be semi-permanent so that it would fit into the long-term plan for the school, which will continue to use the new room alongside other facilities.

The room needed to be suitable for adult learning, since there are plans to offer GCSE and adult education cooking courses in collaboration with the local authority's Adult Education Service. The inspiring practical cooking facilities, coupled with the adult education courses, will help to attract the wider community to the school.



This diagram shows how, at an early stage, the school worked with their architect to identify key activities and how they interrelate in the 'food journey'.

The way forward

Location

Following the briefing process, the architects' first key decision was that the space should be a 'cooking pod', capable of adaptation and relocation over time. The location of this pod would, at first, be at the front of the school, in keeping with the school's vision of bringing in the community.

In the future, when the school is rebuilt, the pod could be moved next to the new cooking facilities, or be connected directly to the dining area.

1 School main entrance
2 Entrance to the pod
3 Garden
4 Dining
5 Science

The 'cooking pod' will be located at the front of the school, visible from the main road. Its modular construction means it can easily be moved to another location in future school remodelling.

Involving staff and students

The architects worked closely with the students and staff to find out what they wanted to see in their new facility. They held a series of workshops with the students, which took the form of design sessions. Students were asked where their preferred locations were, what the new facility should look like, and how they would like to cook. They discussed the possibility of using the space for business and hospitality, as well as involving parents.

The wish list that came from these sessions highlighted the need for flexibility and versatility.

The designs

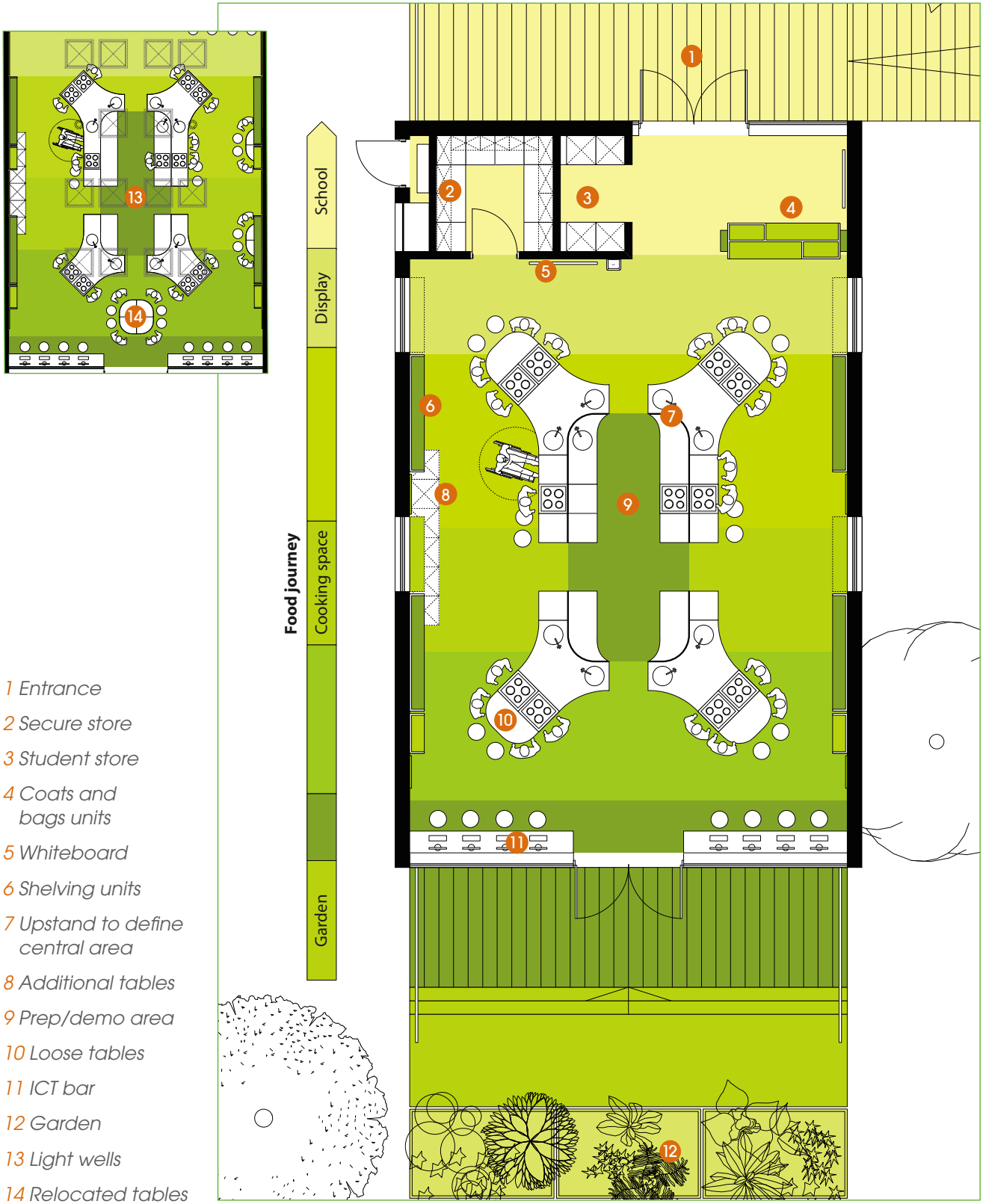
The team was keen to ensure that the cooking pod would be adaptable, with an innovative interior for display, ICT, practical and demonstration activities. To get the best value for money, the architects used a standardised modular system that is available in different configurations.

A central area inspired by sushi restaurants provides space for a teacher to carry out a demonstration surrounded by students, with easy access to all cooking facilities. Around this demo area, 20 students can do practical work. Away from the main preparation space, the ICT 'bar' is close enough to be supervised easily. The pod has direct access to the vegetable garden.

Storage for dry ingredients and final produce as well as students' bags is located at the entrance to the facility, for easy access.

The outside of the pod features exciting graphics and full-height glazing, which are not only enticing to students but also make it obvious what happens inside the room.

The dividing upstand of each sushi bar segment distinguishes between demonstration space and practical areas.



1 Entrance
2 Secure store
3 Student store
4 Coats and bags units
5 Whiteboard
6 Shelving units
7 Upstand to define central area
8 Additional tables
9 Prep/demo area
10 Loose tables
11 ICT bar
12 Garden
13 Light wells
14 Relocated tables

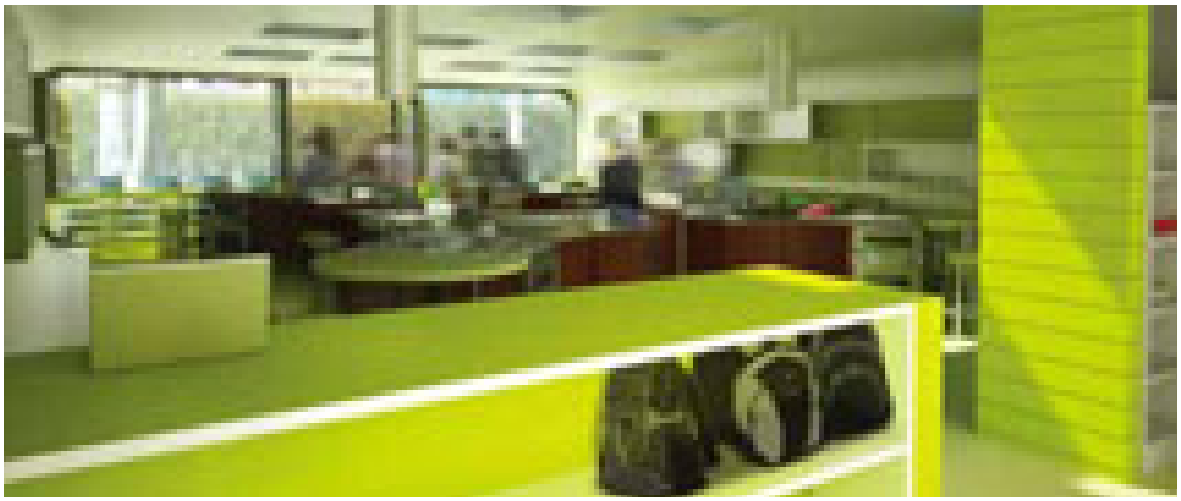
The central prep/demonstration area, surrounded by practical workstations, provides a focus to the room. Loose tables at the end of each workstation can be linked to form circular tables, for group discussion (see inset).

Furniture, equipment and ICT

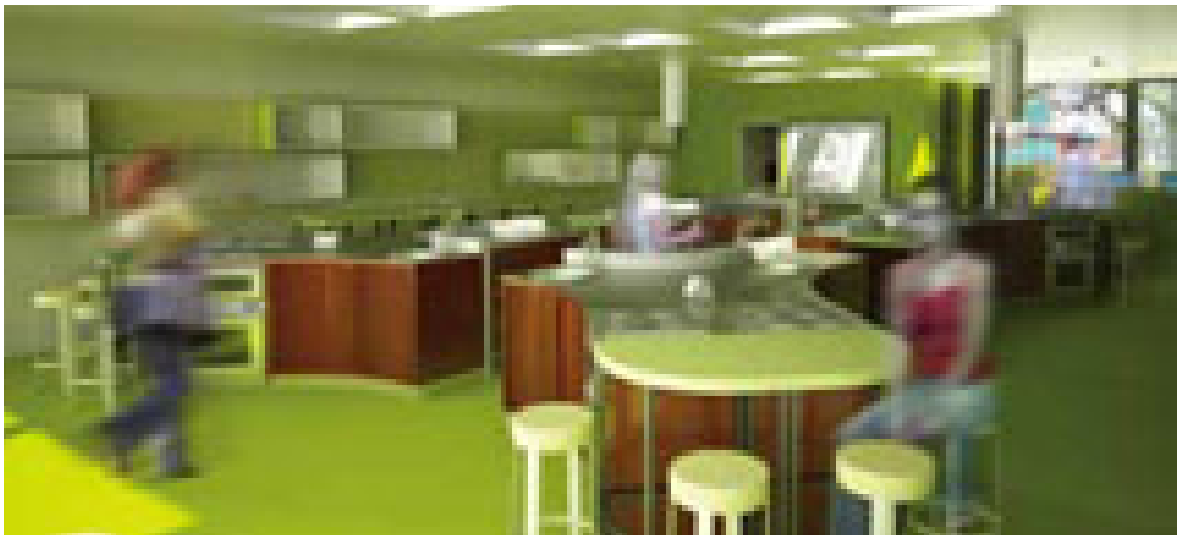
Furniture is fixed, apart from the end table of each practical bay, which can be set up as round tables for discussion, display or other activities. Surfaces are made of a durable recycled acrylic. There is one sink for every two cooking units, with a 50/50 split of gas and electric cookers, so students learn how to cook on both.

ICT is totally integrated into the scheme. Three ICT 'bars' enable 12 students to work at desktop computers (the remainder use laptops), for independent research to supplement information given in the lesson.

Above the central workstation is a video camera, so that cooking demonstrations can be recorded, projected and stored for future use. Wi-fi is available throughout the space, making it more versatile. The room could also be used for geography or science lessons.



Open fronted storage units can be used for display and to ensure an organised space.



The central sushi bar means there are excellent sight lines for both the teacher and students during demonstrations and practical activities.

Environmental design and sustainability

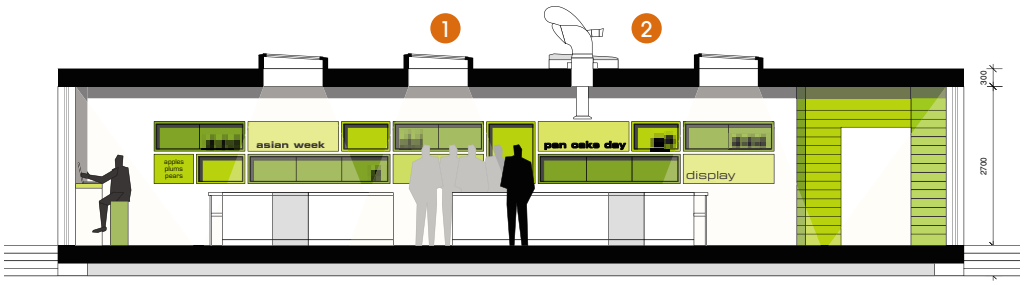
The walls of the pod are double insulated (with alternate layers of insulation, running at 90º to each other), to meet the current building regulations. As a result, the heat loss through the walls is very low. The pod has its own heating system because it was complicated to integrate with the rest of the school's heating infrastructure. This also makes it easier to relocate.

Warm air is electrically heated and pumped through the plinths of the cooking units. Electric heating is controversial because it results in higher running costs and CO_2 emissions but the school decided to use it because it is cheaper to install and gas heating is hard to re-locate.

The pod is naturally ventilated using 'Windcatchers' positioned over the cooking units, aided by mechanical extract fans. The combination of Windcatchers and fans draws warm moist air and smells out of the pod. Opening windows and patio doors at either end of the pod provide cross-ventilation.

Light floods the central space from rooflights, as well as the windows at each end. Integral blinds within the glazing system provide daylight control.

The worktop area in the ICT 'bar' is made from recycled materials.



1 Rooflights to practical areas 2 Windcatchers

This long section through the building shows key environmental features.

Cost

The estimated cost, including furniture and equipment but excluding professional fees and VAT, is £277,000 (Q4 2009).

Key points

- **Bear in mind the school's short-, medium- and long-term plans.**
- **Flexibility is critical – so that teachers can vary their style of teaching and so that the room could potentially be used for other subjects.**
- **Inspire students by using ideas from exciting environments outside school – here, an unusual type of restaurant stimulates the imagination.**
- **Graphics can be an economical way to make food technology rooms more exciting for students – and to convey important messages.**

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Design and Technology Association website – see www.data.org.uk

Eco-Schools and Green Flag website – see www.eco-schools.org.uk

Qualifications and Curriculum Development Agency website, for information on the design and technology curriculum – see www.qcda.gov.uk

The Diploma in Hospitality website – see www.hospitalitydiploma.co.uk

***See www.teachernet.gov.uk/schoolbuildings**

Notes

Notes

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Please quote ref 00135-2010DOM-EN
ISBN: 978-1-84775-653-4

PPBHP/(4171)/0210