

Meaningful Learning Experiences

Strategic Commitment	✓	Part of an academy group series of pilot projects
Curriculum Provision	✓	Addressing part of the National Curriculum for KS3 Science
Employer Partnerships	✓	Using real information from a local construction site
Reflective Young People		
Informed Career Choices	✓	Raising awareness about careers in Construction

Local housing redevelopment provides real data for Science learning about energy and heat loss

Nottingham City Housing (NCH) is working with construction firm Keepmoat to replace five high-rise tower blocks with 142 affordable and sustainable flats in the Lenton Gardens area of the city. Unlike the new flats, the old flats, constructed using Bison concrete construction methods, are not energy efficient. Rushcliffe Academy in Nottingham used this as the basis of a 'REAL Homework' project with Key Stage 3 Science to study energy efficiency and heat loss.

The secondary curriculum requires that Key Stage 3 students are taught about, 'Calculation of fuel uses and costs in the domestic context'. The school had been largely teaching this subject from textbook descriptions and exercises. Keepmoat and NCH provided information about the construction methods of old and new buildings, including apartment layouts, photographs and energy performance certificates. This was used as the basis of the homework challenge.

Year 8 students were given half a term to work on the challenge, which was broken down into a series of tasks that allowed students of all ability levels to get involved: Bronze (energy efficiency poster), Silver (house design in 30-40 years), Gold (energy efficiency leaflet for residents) and Platinum (researching sustainable building materials).

Students' work was displayed at a Year 8 Progress Evening, where parents were able to see outcomes from the project, also showcasing the partnership with Keepmoat and NCH.

Benefits for the Students

- Teamworking, self-management and problem solving were the skills identified by students as having been most developed through the project
- The majority of students said the experience had helped them think about their personal choices and future direction
- *'I have learnt different things that will help me in the future'*
- *'How well I worked in a group. The finished product was nothing short of great'*
- *'Working in a team to complete a set task to a high quality'*

Benefits for the School

- Presenting a purposeful challenge that might have significant community impact and using professional resources from the employers gave a real-life context for the project.
- The project was motivating for students involved, but had a serious objective – to encourage students to develop self-study skills ahead of their GCSE courses.
- Even after the housing development is completed, the resources provided by NCH and Keepmoat can be used to inform and illustrate future classroom learning.

Benefits for the Employer

- Lenton Gardens is an important development for Nottingham City Homes and the project demonstrated community consultation – including young people from the city.

ENERGY LABEL
SIEMENS SK23M2300E

C | New appliances have energy labels to show how efficient they are. More efficient appliances are usually more expensive than less efficient ones.

Sometimes buying a new, more efficient appliance or improving the insulation can cost more money but it tells you how long it will take to pay back the extra costs:

$$\text{payback time} = \frac{\text{cost of saving}}{\text{saving}}$$

For example, diagram D shows how long it will take to pay back the extra costs:

payback time for cavity wall insulation = 1.9 years

payback time for cavity roof insulation = 4.4 years

solar panel for hot water: cost £3500, savings about £70 per year

loft insulation: cost £150, savings around £150 per year

double-glazing: cost £3500+, savings around £200 per year

D | The costs and savings of some ways of reducing energy bills

- Why should you work out the payback times before choosing a new appliance?
- Use the data in diagram D to calculate the payback time for:
 - loft insulation
 - draughtproofing.
- Suggest why the information in diagram D does not give exact values for the savings for each modification.
- Mrs Holman is choosing a fridge. Fridge A costs £120 and costs £27 per year to run. Fridge B costs £150 and costs £22 per year to run. Which one should she buy? Explain your answer.

I can ...

- explain how power companies charge for energy used
- describe what a payback time tells you
- work out payback times.

179

Nottingham City Homes

Energy Performance Certificate

54, Nevigate Court
NOTTINGHAM
NG7 1RB

Dwelling type: Mid floor flat
Date of assessment: 31 March 2009
Date of certificate: 5 April 2009
Reference number: 0658-2809-6474-0271-6191
Total floor area: 66 m²

This home's performance is rated in terms of the energy use per square metre of floor area, energy efficiency based on fuel costs and environmental impact based on carbon dioxide (CO₂) emissions.

Energy Efficiency Rating		Current	Potential
100-91	A		
91-81	B		
81-65	C		
65-55	D		
55-49	E	57	64
49-41	F		
41-35	G		

Environmental Impact (CO ₂) Rating		Current	Potential
100-91	A		
91-81	B		
81-65	C		
65-55	D		
55-49	E	50	54
49-41	F		
41-35	G		

Estimated energy use, carbon dioxide (CO₂) emissions and fuel costs of this home

	Current	Potential
Energy use	419 kWh/m ² per year	388 kWh/m ² per year
Carbon dioxide emissions	4.2 tonnes per year	3.9 tonnes per year
Lighting	£71 per year	£35 per year
Heating	£412 per year	£366 per year
Hot water	£129 per year	£129 per year

Based on standardised assumptions about occupancy, heating patterns and geographical location, the above table provides an indication of how much it will cost to provide lighting, heating and hot water to this home. The fuel costs only take into account the cost of fuel and not any associated service, maintenance or safety inspection. This certificate has been provided for comparative purposes only and enables one home to be compared with another. Always check the date the certificate was issued, because fuel prices can increase over time and energy saving recommendations will evolve.

To see how this home can achieve its potential rating please see the recommended measures.

The address and energy rating of the dwelling in this EPC may be given to EST to provide information on financial help for improving its energy performance.

For advice on how to save money and to find out about offers available to help make your home more energy efficient call 0800 512 012 or visit www.energywise.org.uk/myhome

Page 1 of 5