

Hockerton Housing Project



Educational Site-Visits and Remote Tours

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What is Hockerton Housing Project?

Hockerton Housing Project is the UK's first earth sheltered, self-sufficient, ecological housing development. It has been designed to meet the economic, social and environmental challenges of sustainable development. The residents of the five on-site houses generate their own clean energy; harvest, store and process their own water; recycle waste materials and grow much of their own food. The houses, completed in 1998, remain among the most energy efficient, purpose built dwellings in Europe.

How is Hockerton Housing Project Sustainable?

Hockerton Housing Project has a number of design features that help the development to be sustainable. Here we present an overview of the site's main features covered by our guided tours and relevant to national curricula.

Self-Sufficient Water System

During a guided-tour you will visit the reservoir at the top of the site which provides a water store for all non-drinking use within the homes. Rainwater is collected from the fields and the road and is first drained to a sump before being pumped up to the reservoir. Before water enters homes it passes

through a sand filter system used to remove solid and organic matter.



Water reservoir at the top of the site.

High grade drinking water is collected from conservatory roofs, with 1cm of rain providing 5 weeks supply of water. This rainwater passes through a string filter, a carbon filter and is then sterilised with ultraviolet light before it is pumped into homes.

Waste water and sewage from the homes is settled in a septic tank before it passes into a reed bed system. The reed bed provides a supply of oxygen and bacteria in the water which digest pathogens. The main lake's water quality meets EU bathing standards and is a great habitat for local wildlife.



Reed bed at the main lake.

Solar Panels

Photovoltaic panels line the properties' southern face generating electricity for the homes on-site. The energy generated by these panels is shared by the residents. As part of a guided tour you will walk onto the roof and get up close to our solar panels. From this vantage point you will be able to see the contrast between the rough-earthed area behind the homes and the well-kept gardens and lake to the front.



Solar panels on top of the HHP properties.

Efficient Building Design

Homes are designed to maximise solar gains and conserve energy, mainly through minimising heat loss. There is no need for a central heating system in the homes due to their advanced design. South-facing conservatories with large windows allow thermal energy into homes as the structure absorbs solar radiation. To keep homes consistently warm

thermal energy needs to be stored in the structure of the houses i.e. bricks.



A HHP conservatory capturing solar energy.

To keep a comfortable temperature in the homes draughts must be excluded to prevent the escape of warm air. This is done using an air-tight design. As a consequence of this design ventilation pipes are required to manage airflow between the outside and inside of the houses. To prevent heat loss in the ventilation process, a heat exchanger is used to keep warmer air inside and colder air outside.

500 tons of earth has been spread onto the main part of the houses which provides a further layer of protection from the elements. This earth-sheltering design technique also reduces the visual impact of the development and enabled plants and animal populations to quickly re-colonise the area after construction.



Side view of HHP's Earth-Sheltering.

Additionally, the materials used in the build were sourced from locations as local as possible with the gravel coming from nearby Hoveringham and concrete from Newark.

Organic Produce and Composting

Residents communally grow fruit and vegetables using organic and permaculture principles. Bees are kept in an orchard for honey production and vital plant pollination. HHP residents also keep a brood of hens for daily egg production and raise a small herd of sheep on the site. Producing organic food saves money and reduces pollution from transportation, fertilisers, pesticides and herbicides. All organic waste is stored in compost bins and the resultant material is recycled onto the land for further food production.



HHPs communal composting area.

Wind Turbines

HHP has two on-site wind turbines, each providing around 6,000kWhrs of energy every year. The first of these turbines was installed in 2002. After overcoming local opposition and planning difficulties our 'Proven' turbine became the first operational wind turbine in Nottinghamshire. During a guided tour you will be able to hear the turbines whir as they produce renewable energy.



HHP's 'Proven' Wind Turbine.

What's does HHP offer to visiting schools?

Since completion in 1998, Hockerton Housing Project has established itself as an exemplar of sustainable development both locally and nationally, providing a unique 'real-life' experience of living sustainably. HHP has developed a range of services which are available to educational providers. By the end of a visit you can be confident that your learning objectives will have been met.

Guided Tours

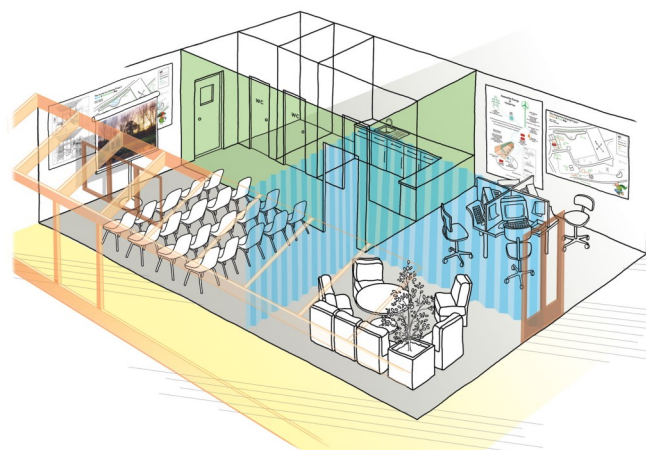
Tours are adaptable and can take between 2-4 hours depending on preferences. A site-tour will include:

- A tour of the project site highlighting renewable energy systems (wind & solar), autonomous water systems, and key elements of landscaping.
- A tour of one of the project members' homes highlighting key environmental features and ultra low energy building design.
- An Audio Visual presentation in our Visitor Centre, showing the history of the development and an explanation of how our homes work. And/or a classroom activity e.g. a debate or carbon footprint exercise.

Tours are adaptable suit to individual needs and interests. For instance, more technical tours are available, with additional material on specific features of the site.



Architects on the roof of the HHP homes during a guided-tour.



Plan view of the visitor centre.

Remote Educational Package

For educational providers that are unable to make a visit, HHP is now offering a new remote educational package. This package includes:

- A Skype tour with a HHP resident, covering areas within Wi-Fi range i.e. resident homes and solar panels.
- A DVD or USB stick with video explanations covering of all of the site's design features and footage from the BBC's 'Inside Out' programme.
- A package of infographics covering HHP's design features and further processes.
- Worksheets aimed at GCSE students to be completed whilst watching the explanation videos.

Visitor Centre

A visitor centre has been built to similar high environmental standards as the homes, with super-insulation, renewable energy and water-harvesting.

The visitor centre offers seminar facilities and a space to complete further activities or lessons following a guided tour. The centre is suitable for groups up to the size of 45 people. Visiting groups are also able to eat their own lunch and use the toilets in the facility. Alternatively, catering can be pre-ordered.

Educational Activities and Lessons

The visitor centre facility can be used as a space for group activities following guided-tours. This is an excellent opportunity for groups to consolidate what they have learnt during their visit and consider how HHP links to their particular subject area.

Designed to support National Curricula, HHP offers a range of educational activities (for different age groups) that are designed to be taught alongside teachers. The activities particularly support the following subjects: Art & Design, Design & Technology, Environmental Science, Geography and Physics.

Teachers are also able to use the Visitor Centre facility to deliver their own lesson plans.

Supported Learning Activities

Wind Turbine Design

Students will learn that rotors, blades and wind speed are factors that determine how much electricity can be generated by a windmill. After viewing a model of HHP's own wind turbine system, students will use paper and card to make up to three modern wind machines (conventional windmill, savonius rotor, helix rotor) and determine which factors affect how well they turn. Students may also build a basic anemometer to measure wind energy.

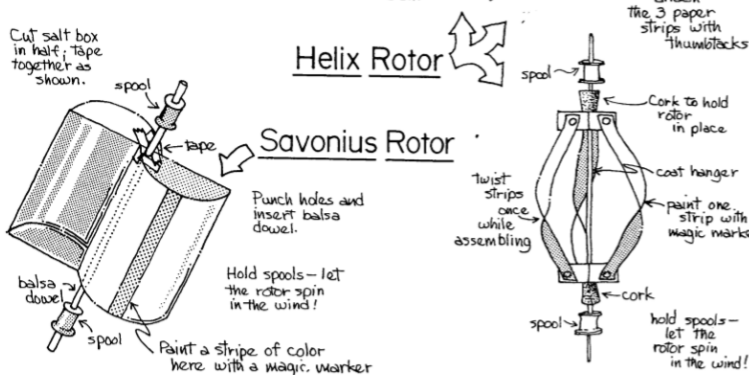
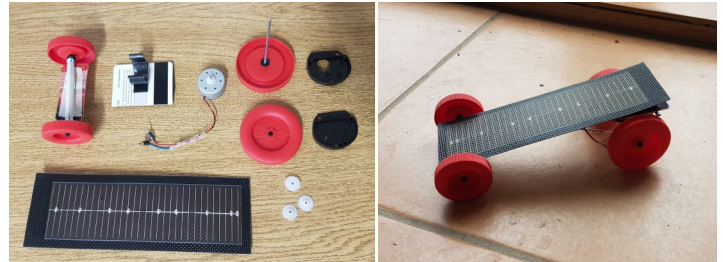


Diagram of wind turbine rotor design from the activity plan.

Solar Cell Car Racing

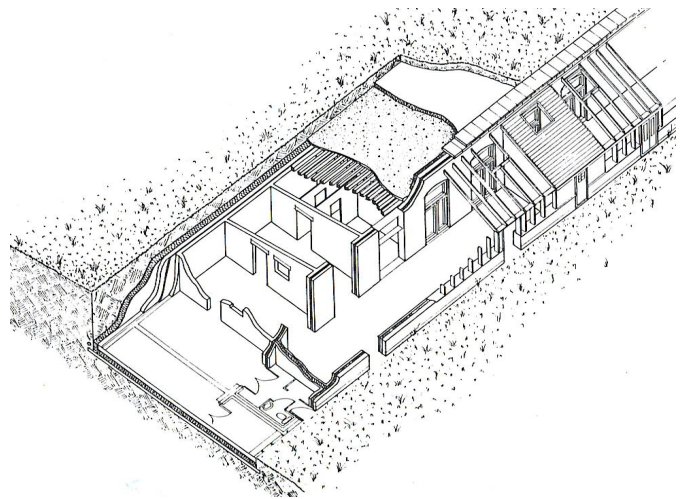
Following on from a tour of HHP's solar power system, students will receive a further short presentation on solar power and photovoltaic cells. Students will then make their own solar powered cars and compete their cars against each other in a race. Alternatively, HHP has kits that enable students to make solar powered windmills, planes, airboats and robotic dogs.



HHP's solar cell powered car.

3-Dimensional Drawing

After learning about the features of HHP's architectural design (including how HHP fits in with the surrounding environment) students will complete a 3-dimensional drawing activity. This could either be a sketch of HHP's landscape design, a sketch of HHP's reed sculpture or a cross-sectional/isometric drawing of one of HHP's eco-homes.



Isometric drawing of one of HHP's eco-homes.

Climate Change Lessons

HHP has 12 climate change based lesson plans available to visiting to schools. Content ranges from the carbon emissions of travel, to the sources of UK electricity and to the climate impact of a non-vegetarian diet. Each lesson includes a presentation and an activity such as the 'Fake News or Donald Trump said' quiz within the climate change denial lesson plan. Teachers can choose the lesson plan(s) most relevant to their subject specification and are welcome to keep the worksheets and materials used during activities.



Trump or Fake News

Did Donald Trump say this or is it Fake News?

Climate Change Denial Lesson Activity.

Water Filtration

This activity will introduce students to the concepts of water pollution and access to clean water through class discussion and a water filtration experiment. Students will filter various substances from water by making their own simple water filters. This experiment can then be compared to HHP's own autonomous water system.



Water filtration activity in a school environment.

Energy Efficiency Calculations

Building upon subject content within school, HHP is able to provide itself as a practical example for energy efficiency calculations. By collecting data from meters around the site, students will be able to calculate the energy efficiency of HHP's solar power and wind turbine systems. To suit different curriculums, teachers are able to choose how this data is manipulated. HHP also owns a heat gun which students can use to view the rates of heat loss when items are placed in differently insulated environments.



HHP's main meter reading point.

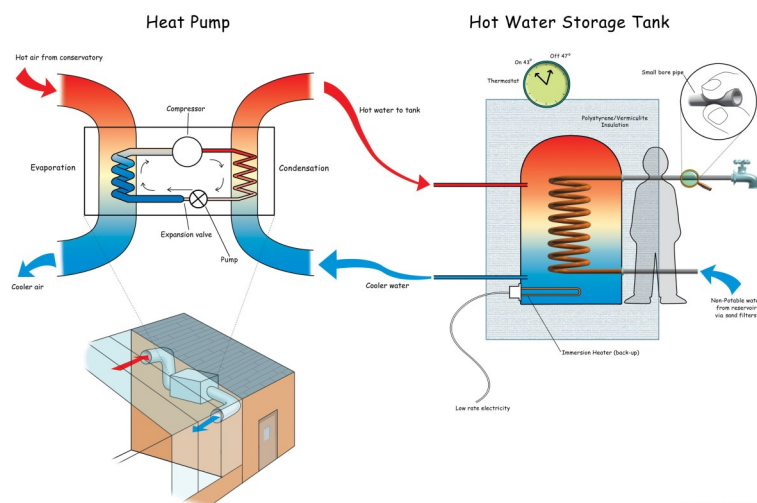
Additional Activity Information

- All of HHP's activities are adaptable to suit the specific wants of visiting educational providers.
- HHP are able to assist in designing worksheets to be completed during site-visit tours and activities, as well as provide expert knowledge in classroom presentations.
- HHP has a range of technical factsheets that it can provide to visiting schools with further details on specific site features including ventilation/air tightness, hot water systems, thermal design, water supply, sewage treatment and energy generation.
- HHP welcome new activity suggestions from visiting educational providers and will do our best to facilitate them.

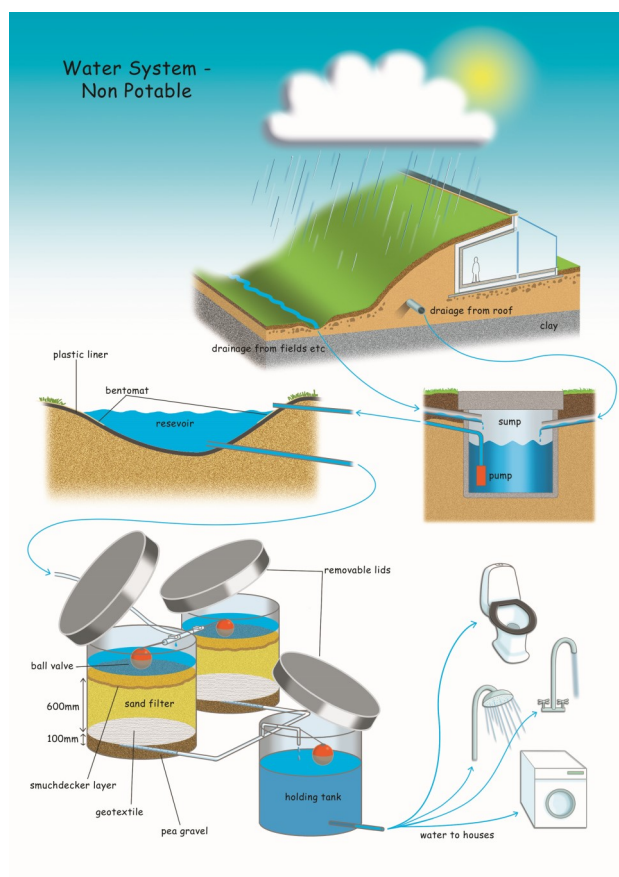
Supporting Materials

To support the content covered during a site-visit HHP can provide a variety of infographics to visiting educational providers. This content may be particularly useful in follow-up classes. On this page are some examples of the graphics that are specific to HHP.

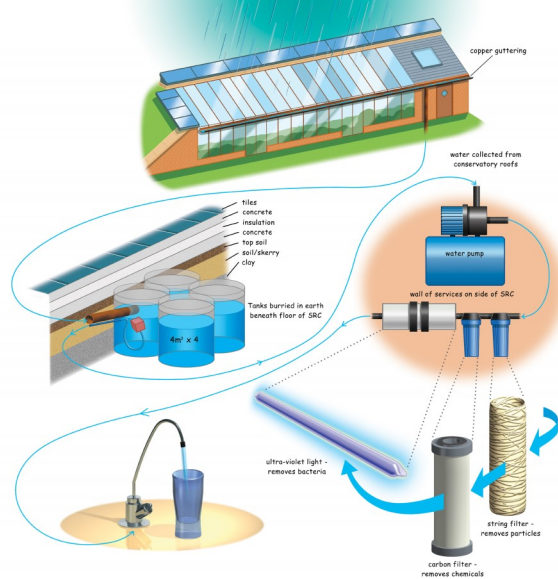
HOT WATER SYSTEM



Copyright © 2004 HHP/Bill Bolton



Potable Water



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National Curriculum Links

Based upon research of national curricula, HHP believes it has strong links to a number of school subjects. This page shows a table of HHP's links with selected GCSE and A-Level subjects specifications.

Site Features

	Composting/Organic Food	Water System	Landscape	Renewable Energy Systems	Building Design
GCSE Art & Design AQA			X		X
GCSE Art & Design Edexcel			X		X
GCSE Art & Design OCR			X		X
A-Level Art & Design AQA			X		X
A-Level Art & Design Edexcel			X		X
A-Level Art & Design OCR			X		X
GCSE Design & Technology				X	
GCSE Design & Technology				X	
GCSE Design & Technology				X	
A-Level Environmental Science				X	X
GCSE Geography AQA	X			X	
GCSE Geography Edexcel				X	X
GCSE Geography OCR				X	
A-Level Geography AQA					X
A-Level Geography Edexcel				X	
A-Level Geography OCR				X	X
GCSE Physics AQA				X	
GCSE Physics Edexcel				X	
GCSE Physics OCR				X	

Educational Activities

Climate Change Lessons									X	X	X	X	X	X			
Energy Efficiency Calculations															X	X	X
3-Dimensional Drawing	X	X	X	X	X												
Solar cell Car racing						X	X	X	X								
Water Filtration																	
Wind Turbine Design						X	X	X	X								

Price Guide

Site Visits

The cost of a visit to HHP depends on the size of the visiting group, the chosen length/detail of tour and whether or not a visiting group chooses to complete an educational activity in the visitor centre.

For a group of 15 students spending a total of 4 hours at HHP, the price estimate is £15 per person. Please enquire for discounts available to larger groups.

At HHP we understand that the cost of coach hire may be a barrier to schools wanting to make a visit. HHP is able to support schools in finding the lowest-cost transport.

Remote Package

Our remote tour and information package includes:

- Remote Skype tour with a HHP resident - including time for questions and answers.
- DVD or USB stick with video explanations covering of all of the site's design features and footage from the BBC's 'Inside Out' programme.
- A package of infographics covering HHP's design features and further processes.
- Worksheets aimed at GCSE students to be completed whilst watching the explanation videos.

Our remote package is new to our education programme and is currently being offered at an introductory price of £100 per school - normal price for this package is £150.

Contact Details

For booking enquiries please use the form on our website:

<https://www.hockertonhousingproject.org.uk/contact-us/>

For more information on what we have to offer please contact us via any of the following:

E-mail: contact@hockertonhousingproject.org.uk

Telephone: +44 (0)1636 816902

Postal Address: Hockerton Housing Project, The Watershed, Gables Drive, Hockerton, Southwell, Nottinghamshire, NG25 0QU.

We are always looking to improve our educational programme so we welcome any feedback that you may have.