

Acknowledgements

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Chapter 7 Can we design a better future?

Activity

London Gherkin	by sarahdav
Chicago City Hall	by Touringcyclist
San Francisco Federal Building	by shaman
J M Tjibaou Cultural Centre	by Tim Waters
BedZED	by triplefocus
Green House, Manchester	by Neil101

Chapter 7 Can We Design A Better Future?

Activity Guidance

In chapter 6 children explored the ways in which people adapt to cope with changing conditions, in both the short term (for example, holiday) and longer term (home design). These adaptations are only part of the suite of changes that we will need to make. To limit climate change in the future, we also need to reduce the amount of Carbon Dioxide, and other green house gases, that we are currently producing. This is called mitigation.

This chapter challenges the children to draw on their existing knowledge and understanding of:

- the causes of climate change
- the changes that may happen to the climate of the North West
- the existing ways of adapting to different climates...

The aim is for pupils to design a product that is **'fit for the future'**.

Fit for the future

The design brief could be for a simple 'product'; a process or system; or for something as extensive as a new school or community building. This will depend on the age, abilities and interests of the children.

The Sustainable Schools Doorways could be used as headings on which to focus the children's ideas. An example of how designing a **'sustainable packed lunch'** fits into the DCSF National Framework 2020 requirements is given below.

Alternatively, to build more directly on the work in Chapter 6, children could look at their homes, school, or community buildings and **redesign** one of them to take into account the need to:

- reduce energy consumption (refer back to Chapter 3)
- reduce water use and waste
- make the best use of the opportunities of climate change (Chapter 5)
- cope with the predicted impacts of climate change (Chapter 5)

Some UK and international examples of inspirational buildings are included, see 'Inspiring designs' (photographs and information in Background Information for Teachers). Children could also carry out internet research to see further examples. For examples from the North West, refer to:

National Trust: <http://www.strawfootprint.org/>

The 'Footprint' is a new National Trust building at St Catherine's, Windermere and is made of straw and other natural building materials. This inspirational place is primarily an education base for schools and is a wonderful example of how we can lessen our impact on the environment whilst at the same time creating an exciting educational and recreational space which compliments the existing landscape.

Green Building, Manchester: Designed with environment-friendly issues high on the agenda, the Green Building is one of the most advanced ecological residential and educational developments in Britain. http://www.terryfarrell.co.uk/projects/sustaining/sust_theGreen.html

Kingsmead Primary School, Northwich, Cheshire: 210 place Primary School on a new housing development; An exemplar project of sustainable construction and collaborative working; www.kingsmead-school.co.uk

Starter Activity

One option is to introduce this design project by examining a selection of packed lunches. To avoid any upset, these may be ones you have prepared yourself, or borrowed from willing volunteers!

- calculate the food miles of the contents, and then, using world maps trace the journey of the ingredients

Recap the links between

- transport (air, sea, road and rail), burning fossil fuels, and green house gas emissions
- manufacturing packaging materials (for example, plastic and aluminium cans) and energy consumption and therefore green house gas emission.

After discussion

- mark items with a big impact on the climate (i.e. transported long distances or by air, heavily processed, heavily packaged) with a sad face 'post-it'.
- mark locally produced items, items with little or no packaging with smiley face 'post-it'.
- take digital photos of the lunches and let the children annotate them with the reasoning behind their choice of signs

Once the lunch has been eaten:

- weigh the material that was to be thrown away for one person for one lunch. Then multiply up for the amount thrown away in a week, month, term and year.
- weigh the material that would be recycled for one person for one lunch. Then multiply up for the amount recycled in a week, month, term and year
- weigh the number of items that will be re-used. Then multiply up for the weight of material that will be kept out of landfill/recycling in a week, month, term and year

Main Activity

Leading on from these calculations, encourage children to think of alternative lunch ingredients, packaging etc. Look at a selection of food products that either you or the children have brought into school.

With the packaging, focus on the quality of the product's design, rather than the purchasing choice of the child or parent.

For example, for heavily packaged items, you may try the phrase:

"Isn't this badly designed! How could you improve on this?"

Recap the links between:

- transport (air, sea and road/rail), burning fossil fuels, and green house gas emissions
- manufacturing packaging materials (e.g. plastic and aluminium cans) and energy consumption and therefore green house gas emission.

Competition

If appropriate, have a 'bring a climate-friendly lunch to school' day and award prizes for the most climate-friendly entries.

- repeat the activities from the starter activity
- bask in your successes and repeat the photographs (compare and contrast)
- spread the word to the other pupils in your school and community via assemblies, your school web site, displays and newspaper articles.

Design a Sustainable, healthy packed lunch

Doorway	Design a sustainable, healthy packed lunch
Food and drink	Use locally produced products, or home/school grown Avoid highly processed and sweetened drinks
Energy and water	Food miles – use local ingredients to reduce energy consumption Use non-processed foods to reduce energy consumption Use seasonal products and avoid those grown in greenhouses during the winter months Have a water butt installed and use this to water the school vegetable garden.
Travel and traffic	Reduce the food miles of your lunch by buying ingredients that have been grown locally. Consider how many car journeys you make to the shops. Can these be reduced?
Purchasing and waste	Use a re-useable drinks bottle. Minimise packaging and plastic wrapping. Use a sandwich box that can be washed and re-used. Compost your peelings and use the compost on your garden. Re use the carrier bag that you put your shopping in at the check out, or buy a 'bag for life'.
Buildings and grounds	Start a school garden and grow your own vegetables. Avoid peat-based composts. Make your own compost. Go organic if you can.
Inclusion and participation	Invite in parents and other family members to talk about lunches that are traditional in their communities.
Local well-being	
Global dimension	Buy fair trade products where possible. Grow vegetables from around the world.

Curriculum links:

Geography: Developing Geographical Skills (2 a,c,d)

Knowledge and understanding of patterns and processes (4b)

Knowledge and understanding of environmental change and sustainable development (5a,b)

Mathematics: Using and applying number

Citizenship:

Developing confidence and responsibility and making the most of their abilities (1a,c)

Preparing to play an active role as citizens (2a,d,j)

Developing a healthy, safer lifestyle (3a)

Design and technology:

Developing, planning and communicating ideas (1a,b)

English: Group discussion and interaction

Useful Websites:

Steelcase - http://www.steelcase.com/na/think_products.aspx?f=11845 constantly seeking more effective ways to conserve resources, prevent pollution and nurture environmental consciousness in people every day, such as the 'think chair', the chair with a brain and a conscience!

[Wasteworks](#) - brand new purpose built recycling education centre In the heart of Manchester (minutes away from Victoria station) with Free school workshops available.

WasteWorks allows young people (KS2) to learn about sustainable living first hand and see recycling in action at The Cooperative in-house recycling centre. A visit to WasteWorks makes sustainability relevant to young people and brings environmental issues to life.

School visits are **free** of charge with an education programme that is interactive/hands-on with links across the curriculum. WasteWorks is managed by environmental charity Waste Watch on behalf of The Cooperative Group.

For further details go to <http://www.co-operative.co.uk/en/wasteworks>

Bookings now being taken – contact wasteworks@co-operative.coop or on 0161 833 4563.

<http://www.informationinspiration.org.uk/> examples of greener design products

Eco Design Fair Directory - <http://www.ecodesignfair.co.uk/directory1.html> - a useful directory of allsorts of sustainable products from fashion to food and drink.

<http://www.dothegreenthing.com/> - Green Thing is a community that makes it easy and enjoyable to be a bit greener. Every month you'll get a different Green Thing to do. All you have to do is do it. October's Green Thing is Walk Once.

Wikipedia - the free encyclopaedia that anyone can edit.

http://en.wikipedia.org/wiki/Cradle_to_Cradle:_Remaking_the_Way_We_Make_Things

Green Building Ideas:

Greenbuildingstore - <http://www.greenbuildingstore.co.uk/case-ecoplus2.php> - is wholly owned and run by Environmental Construction Products Ltd, a company which has specialised in environmentally sensitive building products since 1995. The company is committed to products which promote energy efficient, sustainable and healthy buildings. Check out their case studies - Brenzett C of E Primary School, Brenzett, Kent.

Acorn House - <http://www.acornhouserestaurant.com/> - London's first truly eco-friendly training restaurant. Every aspect from design through to delivery aims to be environmentally conscious and sustainable.

Eco Pod - <http://www.ecohab.co.uk/> - are committed to producing a range of modern comfortable eco homes, which have not only an individual feel, but can achieve a zero carbon rating and a minimal impact on the environment. They utilise systems such as: Solar water heating, wind power, photovoltaic cells, superb insulation, and hot air recovery to cut energy requirements and heating costs by up to 90 per cent, potentially producing virtually no carbon dioxide emissions

The Green Building, Manchester:

http://www.terryfarrell.co.uk/projects/sustaining/sust_theGreen.html

<http://www.sdchecklist-northwest.org.uk> regional free tool for developers and planners to help design more sustainable buildings and developments

Premises Studios - <http://www.premisesstudios.com/> - with more artists getting eco-conscious it was only a matter of time before a fully-fledged eco studio became a reality. **Studio A** is the first solar powered professional recording studio in Europe. Check out their Client List!

Wikipedia - the free encyclopaedia that anyone can edit.

http://en.wikipedia.org/wiki/Cradle_to_Cradle:_Remaking_the_Way_We_Make_Things

http://en.wikipedia.org/wiki/Climate_change

http://en.wikipedia.org/wiki/Mitigation_of_global_warming

Carbon neutral - <http://www.carbonneutral.com> includes items to buy (e.g. carbon neutral flights, eco-kettles etc)

Green Futures - <http://www.forumforthefuture.org.uk/greenfutures/> optimistic magazine that's also on line, lots of useful bits and pieces.

<http://www.ipcc.ch/press/index.htm> latest report on global climate change delivered November 2007, good for up to date facts and figures.

Calculate monitor and reduce your schools carbon footprint

www.carbondetectives.org.uk

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Teacher notes and background information

- Aims
- Background information
- Curriculum link
- Web Links

Aims

This chapter challenges the children to draw on their existing knowledge and understanding of:

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...to design a product that is 'fit for the future'.

Background information (for Chapters 6 and 7)

Adapting and Mitigating

Adapting and mitigating have been widely adopted by researchers and policy makers as the two alternative approaches to dealing with climate change. Adapting refers to actions taken to cope with the changes in the future, which will reduce vulnerability and lessen the negative impacts of those changes. Examples include wearing more sun cream in the hotter summer months, improving flood defences to reduce coastal and inland flooding, and changing agricultural practice to combat increased soil erosion.

Mitigating refers to taking action to actually tackle climate change, by reducing greenhouse gas emissions, hoping to avoid the more serious future consequences. Examples include switching from fossil fuel energy supplies to renewable sources, cutting greenhouse gas emissions from transport and cutting methane emissions from landfill.

The Intergovernmental Policy on Climate Change report November 2007 states that "there is high confidence that neither adaptation nor mitigation alone can avoid all climate change impacts; however, they can complement each other and together can significantly reduce the risks of climate change." It is argued that adaptation responses are now essential because some impacts are already inevitable. It is hoped that these adaptation responses can create more time for mitigation actions to take effect, and that ultimately the more serious consequences can only be avoided by such mitigation.

Mitigating climate change through design

There is growing evidence that the response of the business community to climate change is outpacing that of the government, (although declarations such as all new homes being carbon neutral by 2016 are encouraging). Forum for the Future writes that "the growing profile of climate change has created a critical mass among the business community" as evidenced by the Green Strategy 2007 meeting in London. Jonathan Porritt's book "Capitalism As If the World Matters" (updated 2007) looks

reconciling ecological sustainability and the pursuit of prosperity and personal well being. “Offering people a more equitable and more rewarding way of life whilst living within natural limits”.

This chapter encourages the children to think of “better” designs for products and homes. Green Futures (November 2007) discusses the need to “prepare pupils for a constantly changing world – to think about how things happen and help them question who they are and how they operate in the world”. Pupils today will become the mass consumers and voters of the future, but also the designers and business leaders who can really make a difference.

Curriculum links:

Geography: Developing Geographical Skills (2 a,c,d)
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Mathematics: Using and applying number

Citizenship:
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Preparing to play an active role as citizens (2a,d,j)
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Design and technology:
Developing, planning and communicating ideas (1a,b)

English: Group discussion and interaction

Useful websites

www.velib.paris.fr/ or MFL teachers wishing to use this example within French.

<http://www.recycledproducts.org.uk/view/index.cfm> examples of recycled products.

<http://www.carbonneutral.com> information on how to be carbon neutral.

<http://www.forumforthefuture.org.uk/greenfutures/> optimistic magazine that’s also on line, lots of useful ideas and up to date examples.

<http://www.informationinspiration.org.uk/> examples of greener design products.

<http://www.sdchecklist-northwest.org.uk> regional free tool for developers and planners to design more sustainable buildings and developments

www.kingsmead-school.co.uk an example of a new school development in the North West, built with sustainable construction principles

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Activity Fit for the future resource sheet



Inspiring Designs

30 St Mary Axe, London (2004)

Norman Foster's London landmark building, known as the Gherkin, has raised the standards for sustainable skyscrapers around the world.

Its distinctive tapering profile is the key to its energy efficiency because it creates a pressure difference between inside and outside, driving fresh air into the building. The building has floor-to-ceiling windows, letting in the maximum amount of daylight.

These features reduce the building's energy consumption by half, compared to a typical air conditioned office tower.



The City of Chicago

Chicago Mayor Richard M. Daley has a plan to make Chicago "the greenest city in America."

In 2001, Chicago's City Hall became the site of the first municipal rooftop garden in the nation. Since then, over two hundred buildings throughout the city have added similar gardens.

400,000 trees have been planted; recycled materials are being used to pave the streets; and there are plans to install four wind turbines on the roof of the Daley Center, adjacent to city hall.



San Francisco Federal Building (2006)

The eighteen story home for Federal workers will be the first office tower in the United States of America to eliminate air conditioning, at least over 70 per cent of its area. It does this through a computer-controlled skin, which actively adjusts to weather changes. Its design allows natural ventilation, while metal sunscreens shade the floor-to-ceiling windows.

It is a very bold design: Skip-stop elevators, sky gardens, and open stairs will allow employees to meet each other, hopefully creating a healthy office environment and a healthy culture.



Inspiring Designs

J.M. Tjibaou Cultural Centre, New Caledonia (1998)

These buildings in the South Pacific were the first to show that culture is as important as technology. By using local wood, the distance materials were transported was reduced. By using traditional building methods the local economy of this French island was also supported.

By buildings' shapes resemble the area's traditional Kanak huts. The 10 individual structures dramatically blend into the landscape, while their vertical slats allow the prevailing winds to ventilate the interiors.



BedZED, London (2002)

The "Beddington Zero (fossil) Energy Development"—or BedZED—aims to be carbon neutral.

The aim was to minimize the environmental impact of the building, whilst making it a good place to live.

All of the eighty-two units have gardens to provide a sense of connection to the outdoors. Extra insulation reduces energy consumption—to the point, even, of eliminating the need for conventional heating. Instead, the development uses local tree waste as a fuel source for both heating and power, along with a combination of photo voltaics, wind turbines, and wind-driven ventilation (which explain those distinctive chimneys).



Green Building, Manchester

Designed with environment-friendly issues high on the agenda, the Green Building is one of the most advanced ecological residential and educational developments in Britain.
http://www.terryfarrell.co.uk/projects/sustaining/sust_theGreen.html



Kingsmead Primary School, Northwich, Cheshire

A 210 place primary school on a new housing development;
An exemplar project of sustainable construction and collaborative working;
A learning and teaching environment for the future;
Stimulating design options for future developments in Cheshire.

www.kingsmead-school.co.uk