

Waking up

~ using plants to investigate sustainable development at KS2



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Waking up

Using plants to investigate sustainable development at Key Stage 2

When we get out of bed every morning, wash, dress, eat breakfast and brush our teeth, we are entering into a relationship with plants from around the world.

This resource takes a few everyday items and investigates issues of sustainability for plant materials used in them - such as Aloe vera and palm oil. The emphasis is on teachers and pupils as researchers - writing letters to companies, using IT and applying book based skills. It also includes using the stimulus of a visit to look at the source plants and make connections with the places they are grown.

A key challenge is to support young people as they ask natural, social, economic and political questions which are global [where the plants are grown], local [where the plants are processed and sold] and about trade between the two.

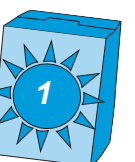
What plants give us our products? Where do they grow?
Who brings them to us? Who benefits? Are the relationships sustainable?

We trust that the ideas and frameworks we have developed will enable you to support detective work in your own classrooms, stimulating a huge variety of teaching and learning skills, raising many questions and issues, and making plenty of new discoveries on the way.

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The ideas in this resource come directly from project work and classroom practice involving six Key Stage 2 teachers in Birmingham schools, during 1998 and 1999. The teachers were supported by staff from DEC and Birmingham Botanical Gardens Study Centre

Waking up

"Even as adults, when we look at it, it's a real eye-opener how many plants we use."

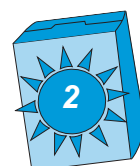
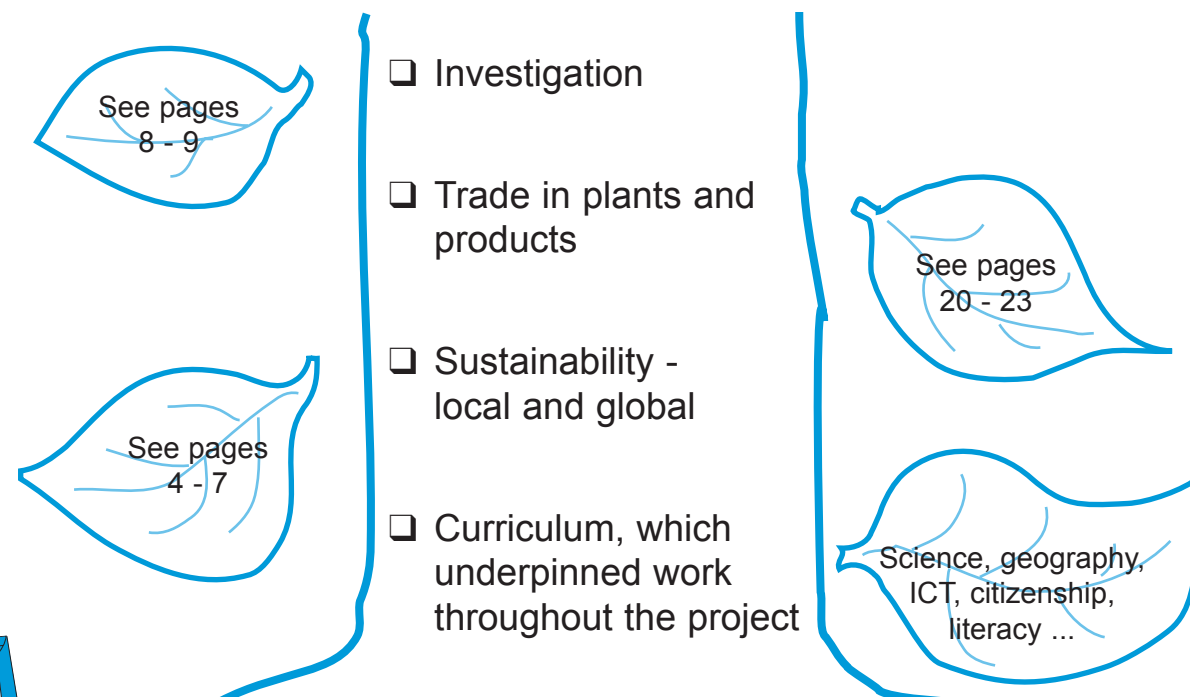
All of the children involved in this investigation began by looking at the items they use between getting up and going to school.

Further investigation revealed the unseen plants that go into making up these everyday products

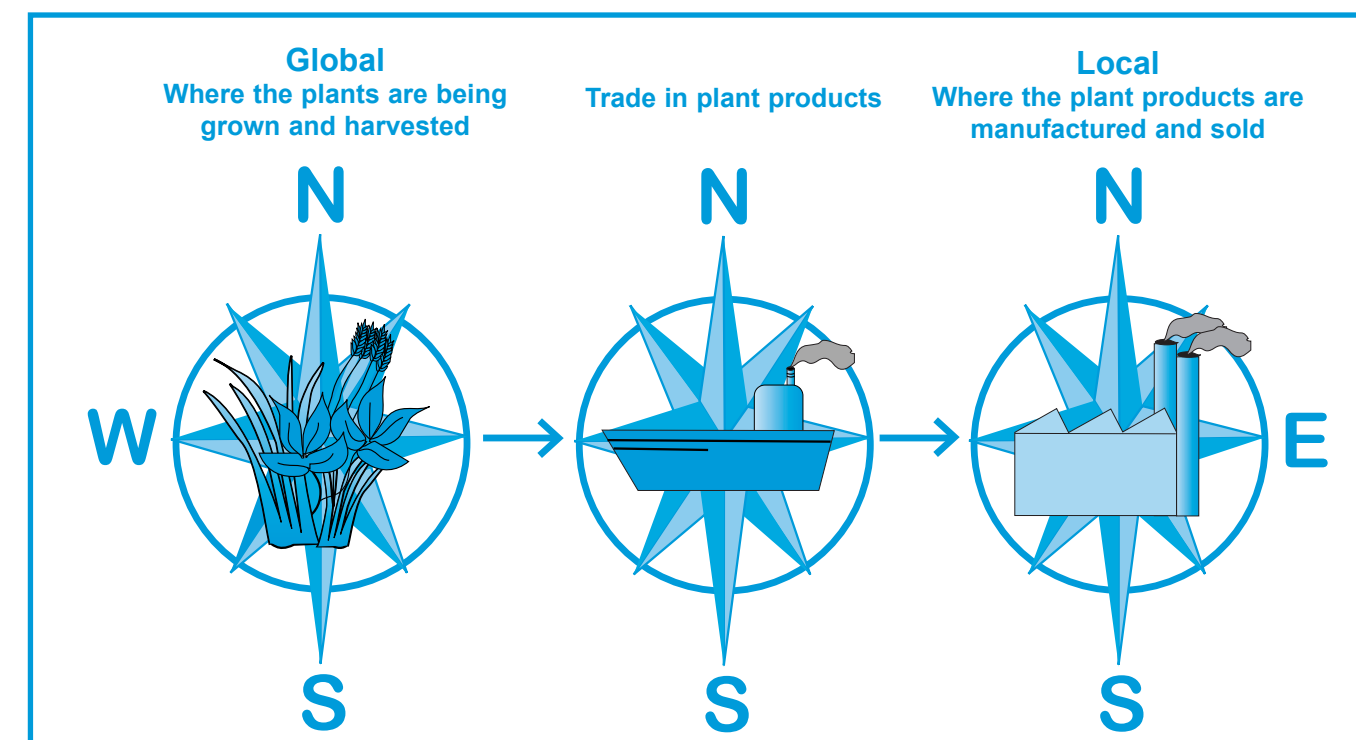
Beginning with something which was within their experience provided a concrete and manageable starting point. [See pages 12 and 13].

Initial planning

We identified four main strands for developing the theme in the context of our own schools.



We used the development compass rose as a planning tool to raise questions about sustainable development at different stages of the process from growing plants to consuming the finished product.



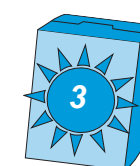
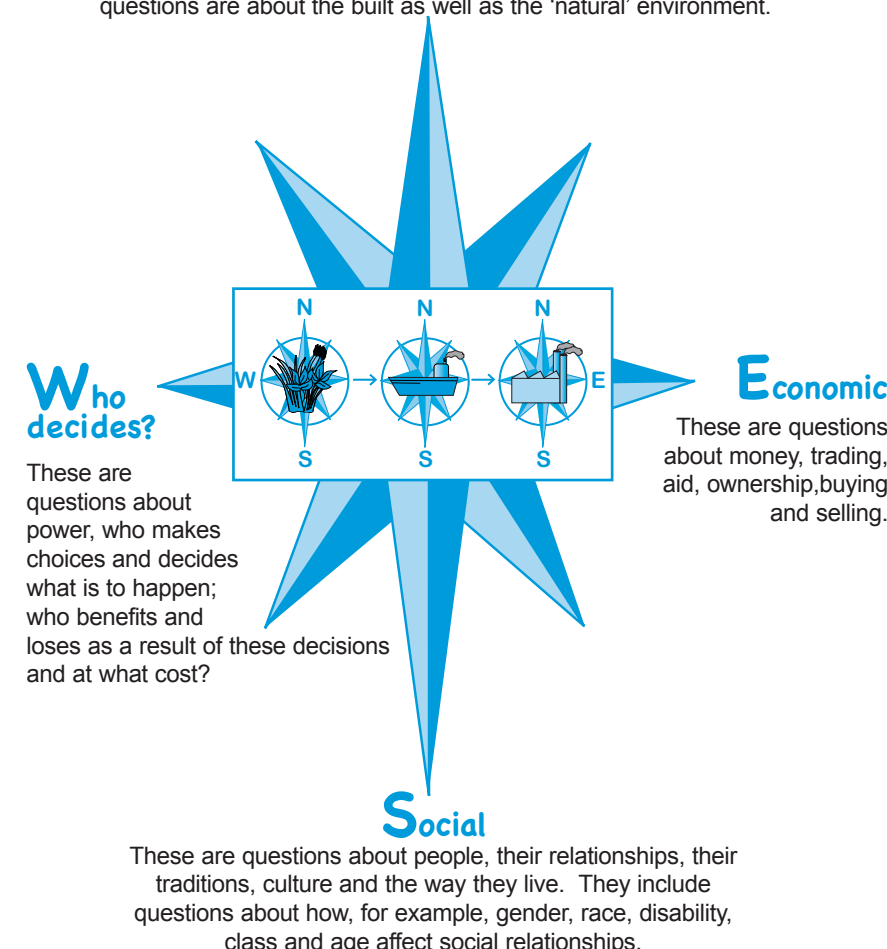
Natural

These are questions about the environment - energy, air, water, soil, living things and their relationship to each other. These questions are about the built as well as the 'natural' environment.

The development compass rose is a framework which:

- encourages us to ask a range of questions about development issues in any place or situation
- is used to raise questions about development issues and their interrelationship with environmental, social, economic and political issues ... as well as the relationship between these points
- is particularly useful for helping us to focus on the commonality between what can appear to be quite different situations
- can be used to help enquiry about places, issues, or photographs representing a place or situation

We found it a useful framework for considering each stage of the process from growing to consumption, as well as for looking at that overall process.



Sustainable development

There are many definitions of sustainable development.

For us, it is important that the idea makes connections between different areas of human activity, and the worldwide environments in which people live and work.

For example, when looking at a plant we might particularly consider its environmental needs, but when considering the people who grow it or trade in it, social and economic issues, or political and justice questions often come to the fore. On further questioning, we find that all of these things are tied together.

We found the Development Compass Rose [p3] a particularly useful framework for looking at sustainable development - in its component parts, and to help make the connections between those parts.

people have got together to meet a local need

co-operative working

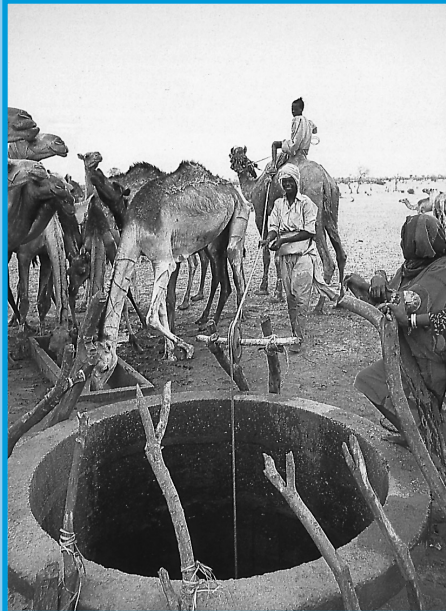
improving the quality of life for the people

thinking of turning dry land into something sustainable

awareness of value of finite resources

reflective and forward thinking

happy and hard working



awareness of environmental factors

positive outside interference

development with old and new technology

treading lightly on land - not to leave 'footprints'

limiting erosion?

sustainability in adversity

at the edge

uncertainty

"You don't really think if you have a bath today you won't have a cup of tea tomorrow."

local produce

looks natural

fresh - not transported

positive image of women at work

cuts out the person in the middle

community growing

people reaping the benefits of their own work

control

making choices

celebrates diversity in a number of ways



pride in their work

ownership

look happy

local consumption

un-manufactured

community closeness

at ease with situation

no exploitation

overseeing whole process

no commercial interference / control

deciding for themselves what to grow

The other important idea for us is that sustainable development should be forward looking, taking responsibility for the future.

With this in mind, we selected two photographs from the Tide~DEC photopack **A world of investigations** as examples of people who were 'living today, with tomorrow in mind'. In other words, behaving in a way which was more - rather than less - sustainable.

The aim of the activity was to discuss and sketch out some of those qualities which suggested sustainable development to us. This meant making some assumptions about what might be happening in the photos. We put each photo in the middle of a large sheet of paper and listed around the edges those qualities which came to mind.

You could try a similar activity with this - or another - pack of photographs of people from different places. Children could choose their own photos and raise questions about they ways in which people depicted might be 'living today, with tomorrow in mind'.

Many local authorities use a list called 'the thirteen themes' as a guide to what a sustainable community should look like.

Year 6 children at Albert Bradbeer Junior looked at these themes, and adapted them into guidelines for their own school as a sustainable community.

"We noticed that people everywhere face similar challenges about the future."

School as a sustainable community



Resources

Resources are used efficiently and waste is minimised.



Safety

Everyone can live without fear of bullying or persecution.



Pollution

Pollution such as crisp packets being dropped, is limited to levels which natural systems can deal with without damage.



D.E.C

Knowledge

Everyone has access to skills, knowledge and information.



Basic Needs

Everyone has access to food, water, shelter and an interesting education.



Leisure

Opportunities for culture, leisure and recreation are readily available to all.



Satisfying Work

Everyone has the opportunity to undertake satisfying work.



Distinctiveness

Our school should be celebrated for being different from all other schools.



Health

People's good health is protected.



Empowerment

Everyone should have the rights to be listened to and listen to other people.

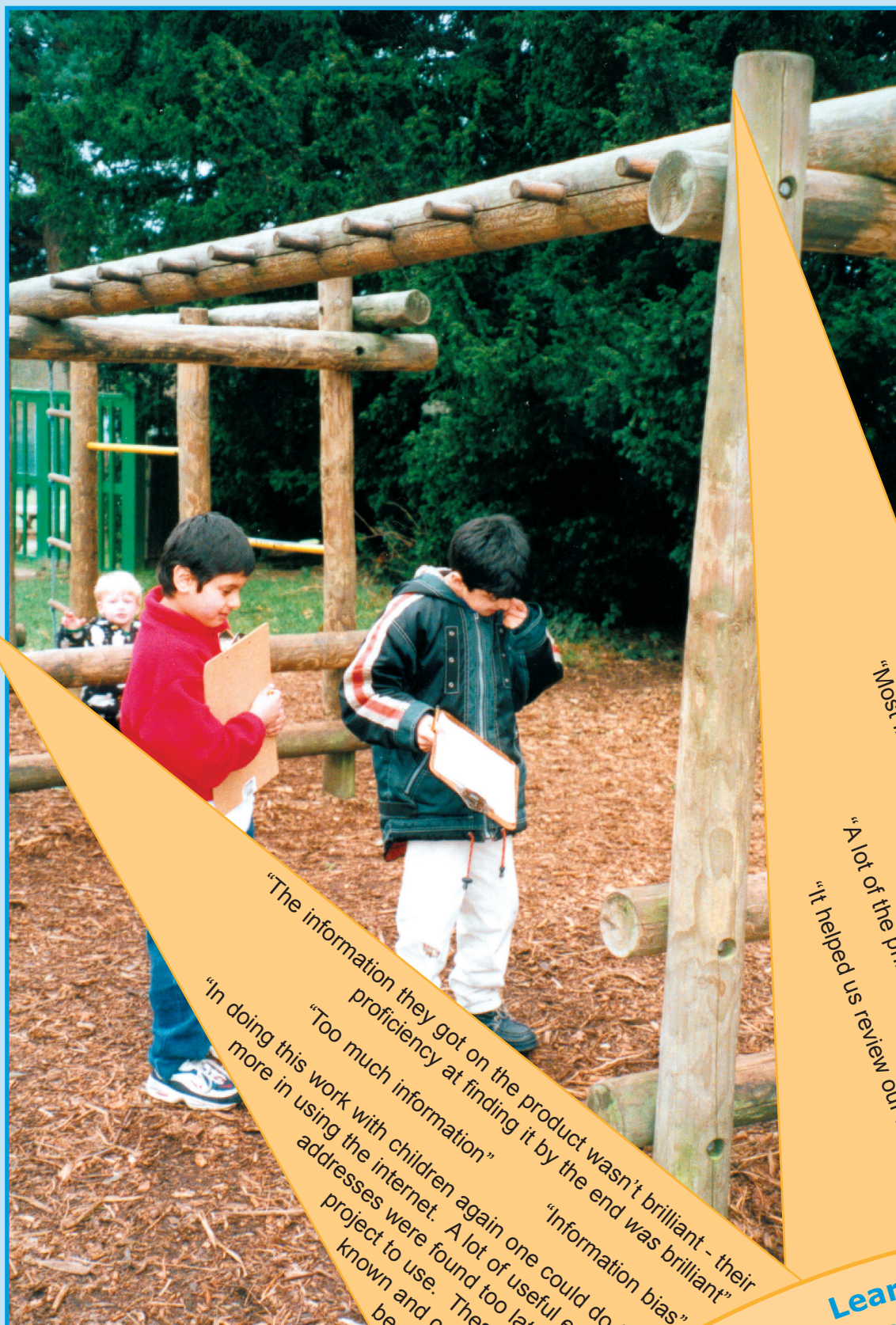


Access

Access to facilities is fair and everyone has access to a range of facilities.

The thirteen themes - and case studies based on attempts to put them into practice - can be visited on-line at: <http://cities21.com/europractice>





"The information they got on the product wasn't brilliant - their proficiency at finding it by the end was brilliant"

"Too much information"

"In doing this work with children again one could do far more in using the internet. A lot of useful e-mail addresses were found too late in the project to use. These are now known and could certainly be made more use of."

"Information bias"

"Information they got on the product wasn't brilliant - their proficiency at finding it by the end was brilliant"

Information rich society

Elements:

Learning in a fast changing world

Why investigate?

We think that investigations generate unexpected and challenging outcomes which excite and equip children for better thinking and learning.

Teachers & children as learners

"Had a purpose for looking."

"The children came up with sources we hadn't thought of ourselves."

"Because they had more ownership they felt more passionate about it - there was a lot of real learning .. Year 6 is now 'The Brazil Nut Year'."

"Detecting information bias and dealing with it - becoming 'information literate'."

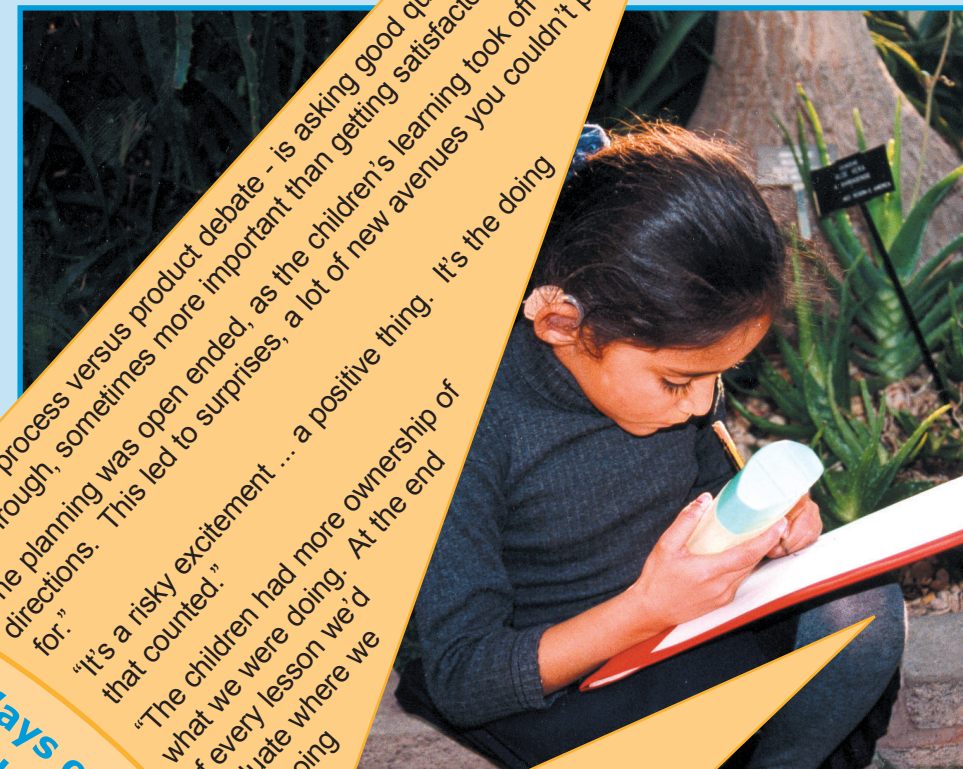
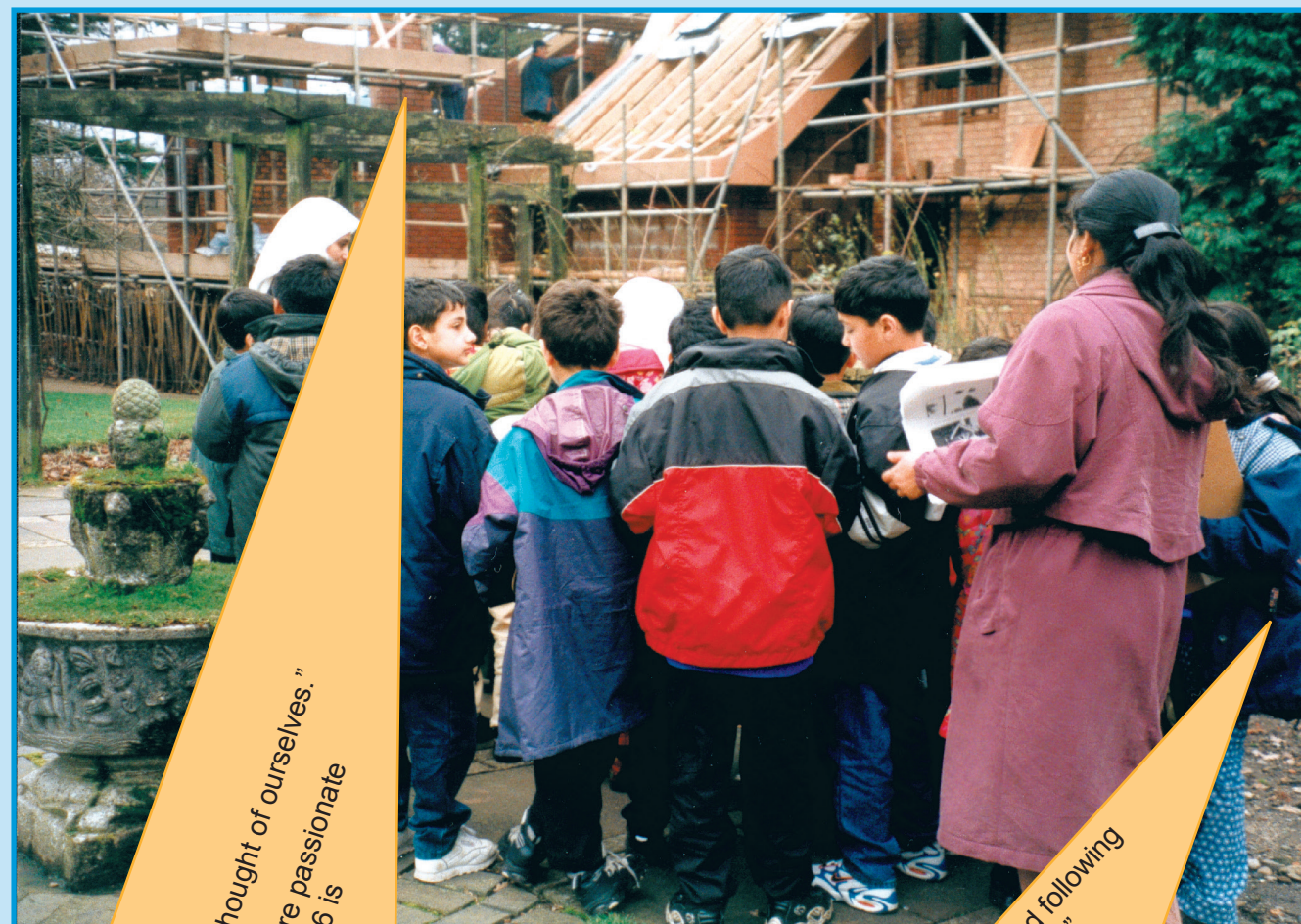
Ways of working

"We had a process versus product debate - is asking good questions ... and following them through, sometimes more important than getting satisfactory answers?"

"The planning was open ended, as the children's learning took off in different directions. This led to surprises, a lot of new avenues you couldn't plan for."

"It's a risky excitement ... a positive thing. It's the doing that counted."

"The children had more ownership of every lesson we'd evaluate where we were going next."



Education for sustainable development

“Education for sustainable development enables people to develop the knowledge, values and skills to participate in decisions about the way we do things individually and collectively, both locally and globally, that will improve the quality of life now without damaging the planet for the future”

The Holland Report - Education for Sustainable Development in the schools sector - report to DfEE/QCA, 1998

Taking the report's seven key concepts, we applied them to *Waking up*.

We found the concepts a useful tool for relating all our work to sustainable development, and that we could fit this readily into the various categories. We found the concepts useful for raising questions of both content and delivery. Some of the activities we carried out are pinpointed under the relevant key concepts.



1 Interdependence

Understanding how people, the environment and the economy are inextricably linked at all levels from local to global

- Waking up linked local, trade and global issues
- questionnaires to companies and charities
- investigations - plants, companies, trade; where products come from; people, environment, economy; who profits?
- plant passports

7 Uncertainty and precaution

Acknowledging that there is a range of possible approaches to sustainability and that situations are constantly changing, indicating a need for flexibility and lifelong learning

- recognising that answers aren't always there - through research
- the story changes depending on who is telling it - letter writing to companies and charities
- complexity of issues - through role play, debate, compass rose
- developing transferable skills - managing the insecurities of the investigative process, handling data etc.

6 Sustainable change

Understanding that resources are finite and that this has implications for people's lifestyles, and for commerce and industry

- recognising that resources may be finite through role play and simulation
- looking at growing process: investigating the use of parts of plants presently discarded - interview with company representative
- investigating growing and cropping process - recycling unused plant material into the soil
- generating questions about transport - products from around the world or local produce?

2 Citizenship and Stewardship

Recognising the importance of taking individual responsibility and action to ensure the world is a better place

- critical dialogue with companies: letter-writing etc.
- decision-making via role play
- co-operative responsibility for carrying out investigations
- listening to arguments and valuing opinions of others through debate

3 Needs and rights of future generations

Understanding our own basic needs and the implications of actions taken today for the needs of future generations

- equity - eg rights of rainforest people
- learning about reliance on other people around the world for everyday items
- discovering positive and negative implications of buying certain products, or from particular sources

4 Diversity

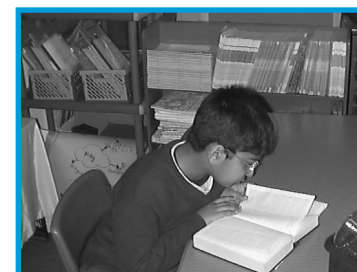
Respecting and valuing both human diversity - cultural, social and economic - and biodiversity

- finding out about the huge range of plants involved in Waking up
- learning about people from other parts of the world and their ways of life
- asking questions about the lifestyle of others
- sense of common issues - through the compass rose

5 Quality of life

Acknowledging that global equity and justice are essential elements of sustainability and that basic needs must be met universally

- inequality of information - uncovering shielding of information by some companies
- asking questions about power - eg looking at land ownership
- researching who benefits economically - through comparisons of pricing
- investigating political control over processes - what is sold, in what form and where



Teaching and learning

Starting point

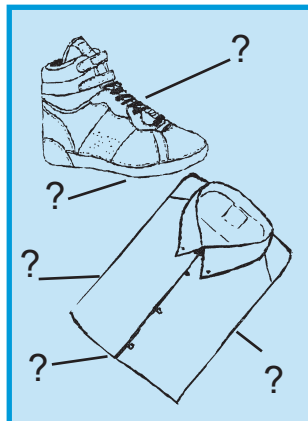
Don't underestimate the value of plants!

Practical opportunities to discover and explore the vast range of products which are derived from plants

Plants in products

We assembled a variety of objects on a table [eg books, crockery, foods and clothing]. Children were given time to handle the objects and use prior knowledge to determine, firstly, whether they were natural or artificial.

They then used evidence [eg on packaging] to decide which of the natural products contained plant components.



Starting the day

Children were asked to brainstorm, in groups, what they used or ate before they came to school. A basket of products was used as a prompt. The children used worksheets to discover for themselves the plants used in a particular product [see for example, page 13].

What have we used / eaten before arriving at school?

Washing
soap
shampoo
toothpaste

Cleaning teeth
toothpaste

Cosmetics
creams
hairspray
lipstick

Getting dressed
shirt (cotton)
blouse

Breakfast
bread
marmalade
grapefruit
coco-pops
drinks ^{tea} coffee

eat breakfast
spoon
plate
milk
sugar
cornflakes/
rice krispies
toast

have a bath
shampoo
soap
water
wash your body
sponge
jug
shower

wash your face
soap
water

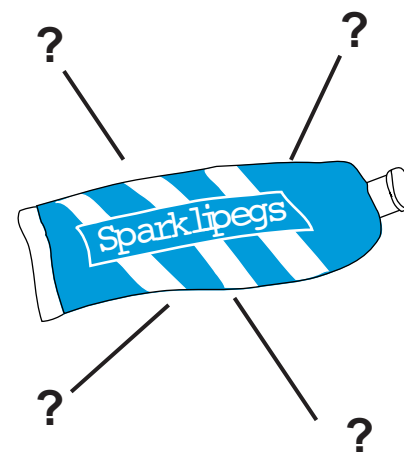
brush your teeth
tooth paste
tooth brush
drink water

put clothes on
uniform
underclothes
dress
vest
tights
shoes/socks
coat
gloves/hat/scarf

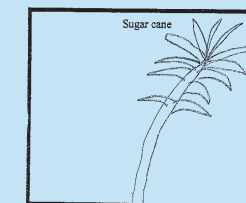
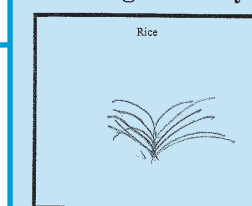
MY WAKING UP POEM

Monday morning time to stop the snoring
I must get out of my bed!
I have my face washed
I have my hair brushed.
I go downstairs
I sip my tea
I kiss good bye
I put on my coat
and go to school.

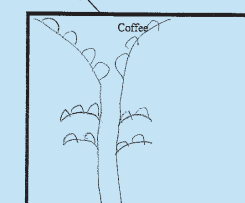
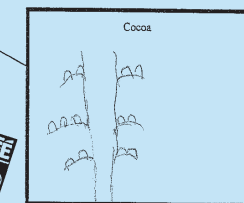
Our Visit to the Botanical gardens
When we wake up in the morning we wash our teeth without plants we couldn't.
we dress in the morning but if we had no plants we would be naked. And soon if people use too much of plants we will be naked and we will not be able to wash. But Aloe vera is a very special plant because it is used for shampoos and to soothe people's cuts. And I learnt that there is a fly that lives in Guyana. The country that it came from is America. Its climate is the desert his height is about 30cm.



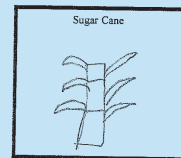
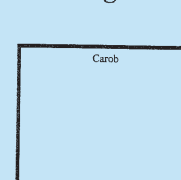
Starting The Day



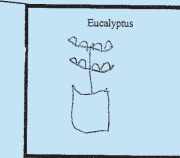
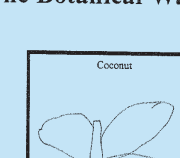
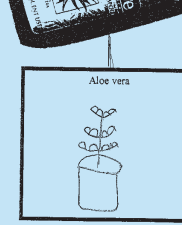
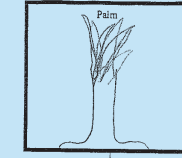
The Botanical Way



Starting The Day



The Botanical Way



Looking at plants

When we wake up we come from under a blanket which has cotton in it and when you brush your teeth Eucalyptus and coconut and vanilla and palm. We have a bath and use soap which can have coconut in it we have coffee, tea or Ovaltine which has cocoa in it. If you go in a car it has rubber wheels

Extracts from them are used for creams



Aloe Vera
country: Central America
climate: dry
Height: 23cms
Appearance: very dull

The value of plants

Plants are used in a huge variety of ways. Here are some suggestions which you could use as a prompt.

Life Support

Plants provide oxygen, protect soils and regulate water cycles in all environments from dry desert to wetlands

Genetic Store

Cultivated varieties can be improved by breeding with wild varieties

Raw materials

Plants provide us with industrial materials and chemicals

Cultural

Recognition of plants in our lives reflected through religion, festivals, and story telling

Medicines

Green medicine has been used for thousands of years

Decorative

Beautiful plants enhance our lives

Food

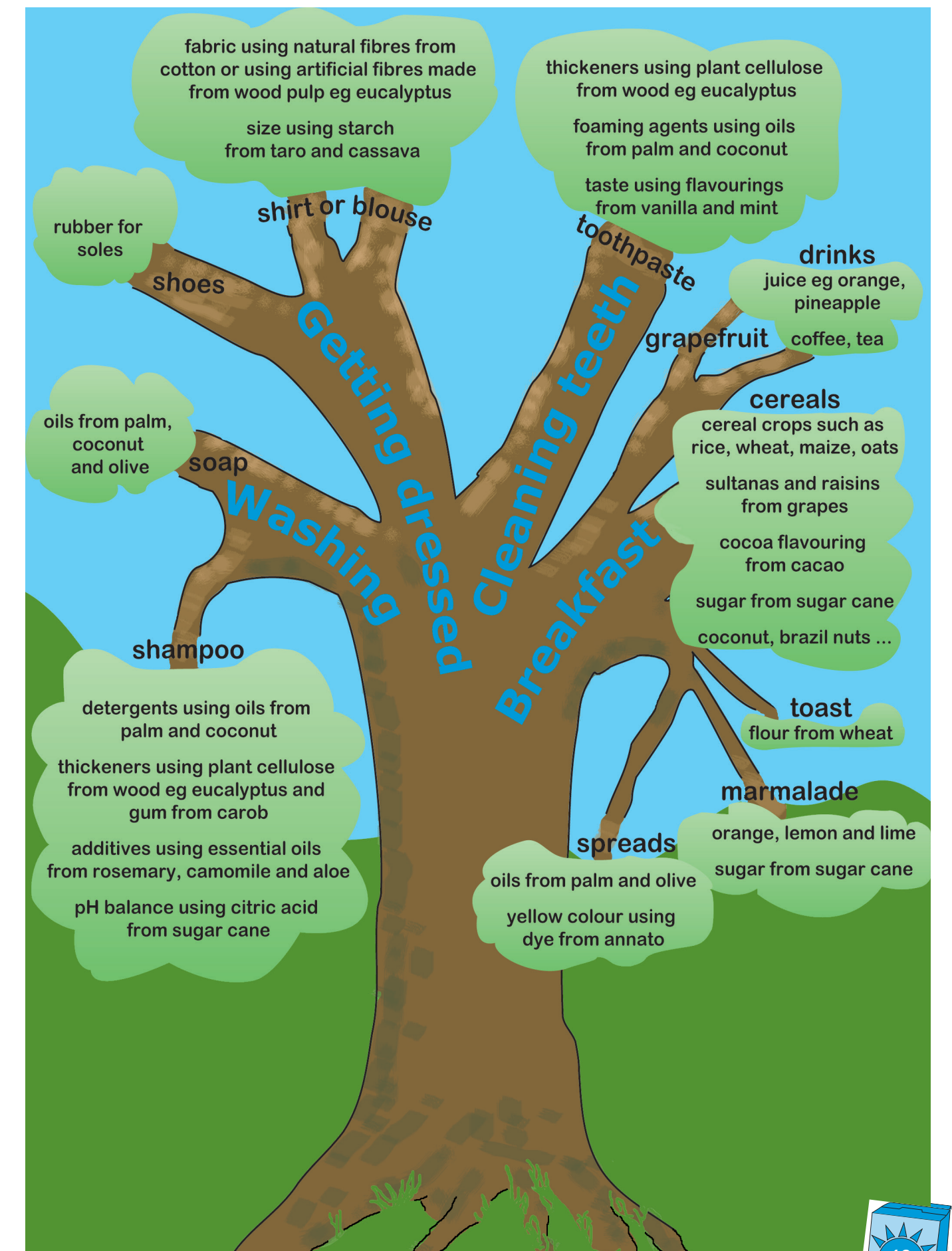
Plants provide many different foods for humans as well as other animals

Habitat

Plants can provide living space for many species of animal as well as other plants

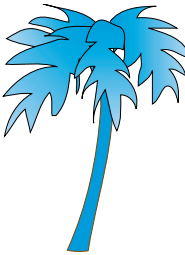
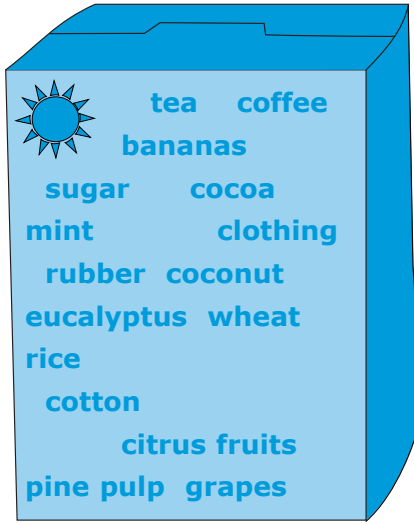
Starting the day

Here are just some of the plant products which we come across when we wake up.



Planning

- We all
- aimed to raise complex issues / generate questions - around sustainability at point of production, trade and consumption
 - included an investigational element
 - made a stimulus visit central to the planning stage
 - matched curriculum plans with our choice of plants
 - selected plants used when we wake up
 - chose plants which were grown in different parts of the world
 - made an informed choice - to ensure that data could be accessed



At **Wyndcliffe**, working in a Year 5 class, we centred our project around palm oil. Why? Because it linked appropriately to Kenya, where we look particularly at ways of living both at home and further afield.

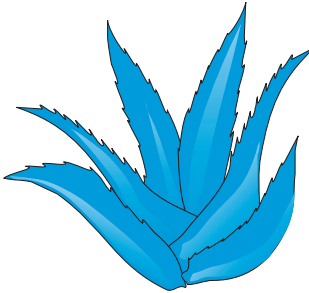
Our main aims in planning were to enhance investigative learning. We found, surprisingly, that this was perfectly exploited during the literacy hour! [Through non fiction, challenging text, work at word / sentence / text levels].

At **Albert Bradbeer** we selected Brazil nuts as part of our topic on environmental change in the Amazonian rainforest. Waking up was carried out with two Year 6 classes.

It became part of our cross-curricular planning - and was incorporated into literacy, art, technology and science as well as geography. The work was planned to be delivered over one term.



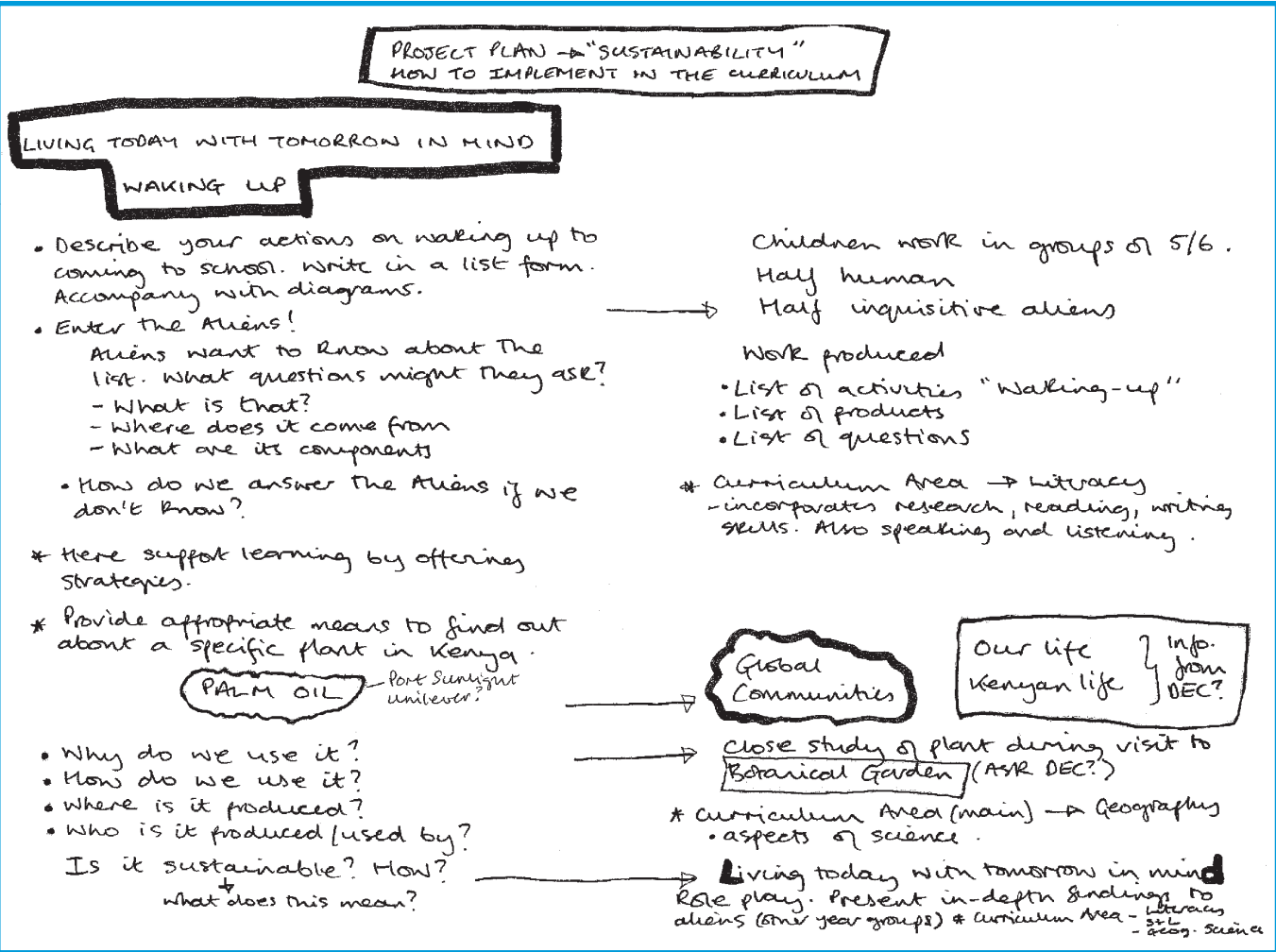
At **Nansen** our focus was to be investigative researchers, and the choice of Aloe vera as our plant was a secondary concern. The project was conducted by four Year 3 classes and took place during our history, geography and art sessions.



At **St Brigid's** we also chose Aloe vera, as our Year 5 focus plant. We were able to use it to extend our investigation across the curriculum.



Investigating plants at the Botanical Gardens. We all experienced finding out new information alongside the children, sharing their sense of insecurity and excitement in going into the 'unknown'.



Initial draft plan at Wyndcliffe

Conway School
Year 4
Teachers : Ms Simpson & Mrs. Londresborough

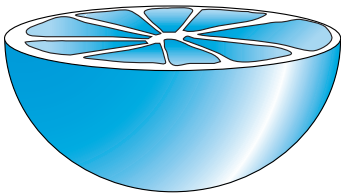
Wake Up Project Plan
SUSTAINABILITY

Lesson / Date	Activity	Skills
Lesson 1	Explain how in the morning we wake up and use a variety of products produced from plants. Explain the Wake Up Project. Introduce the Grapefruit. Show and explain the compass rose. Groups to produce 'wh' questions to ask the grapefruit. Each group to report back to the whole class. Explain the term and issue of sustainability.	Science - current topic of healthy eating. Speaking and listening
Lesson 2	Investigate where we get grapefruits from? Then discuss where do they get grapefruits from? Groups of children to write to suppliers and ask particular questions.	Language - Speaking and listening and Writing and ICT (word processing)
Lesson 3	Research the history of the grapefruit using books and the internet. Create a display of information.	History Language research skills
Visit to the Botanical Gardens	Identify citrus plants. Locate other plants used for different purposes. Identify countries where plants grow. Other activities to plan.	Geography - distant places - link to next topic of St. Lucia.
Lesson 4	Evaluate any written responses from pupil's letters. Role play producers of grapefruits, farmers, community members.	Speaking and listening Reading Drama
Lesson 5	Issues of export, seasonal fruits, price and cost to all! Evaluate from this to plan the rest of project.	

At **Conway**, two Year 4 classes chose to research the grapefruit. The emphasis was on research skills, particularly in relation to geography [we linked the research to a study of St Lucia] and literacy [letter-writing, drama and hot seating were important elements in what we did].

We made an initial five lesson plan. This was to include activities at Birmingham Botanical Gardens during week three. It was decided to leave the plan

open ended because we did not know what findings were going to come from the lessons.



Stimulus visits

We all incorporated a class visit into our planning. Some of us began with the visit as a “springboard” into our product’s research. Others used the visit as a “mid-point” focus.

You could use the visit to consolidate the children’s learning - and leave them asking more questions. At whatever stage you choose to include a visit there are many places that will enhance a project like this.

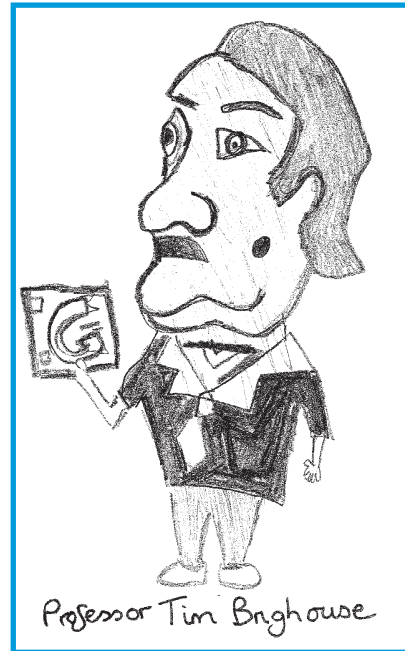
“We would like your ideas about the importance of school trips and how they help children learn, called ‘trauma learning’.”

Extract from letter from year six children to Professor Tim Brighouse.

The five writers also enclosed a caricature they had made of him speaking at a Forward Thinking event.

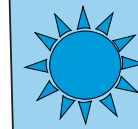
“I mean by trauma learning that you can have an experience so vivid that it has a lasting and deep impression on you. It excites your interest and your emotions so you remember more or are perhaps brought to think about something in a different way and more clearly and with greater energy. So day trips, or residential visits, or school plays or orchestral performances or sporting activity - or a big collective event - all might bring about “trauma” learning.”

Tim Brighouse



Visit to Botanical Gardens

- What does our plant look like?
- Where does it grow?
- Has it been “transported?”
- Where is it found now?
- What does the climate feels like?



Value-added trips [V.A.T.]

- Awe and wonder
- Cross-curricular links: science, art, language, geography, PSE, maths, citizenship
- Cross-cultural learning - validating child’s own cultural heritage
- Experience real life
- Social skills enhancing
- Speaking and listening
- Learning actively
- Independent / collaborative learning
- Full multi-sensory experience
- Extending children’s world



At Albert Bradbeer Year 6 children placed photos of plants they found at the Gardens in the centre of a large sheet, and used observation to extend the pictures beyond the frame of the photo.



Children searched the gardens for plants they might use in the morning, and made short observational sketches using worksheets like the one on the left.

A plant we use to wash ourselves with

A plant we eat for breakfast

A plant we drink for breakfast

A plant we wear to school

We visited the Birmingham Botanical Gardens ...

but we could have visited ...

- product factories eg “Cadbury’s World”
- supermarkets
- other retail outlets eg Holland and Barrett
- headquarters eg Body Shop
- container ports and depots eg Eurofreight terminals
- garden centres
- local park
- nature reserves
- allotments

Generating questions and raising issues

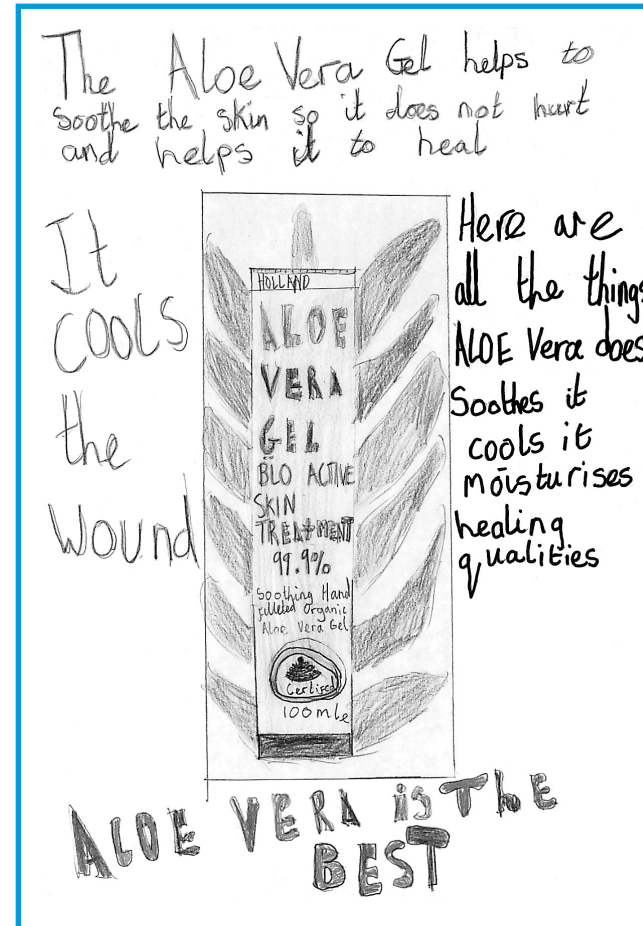
Leading on from our initial brainstorming sessions, which involved spontaneous suggestions offered by the children, the task was to research the answers, using different media.

At St Brigid's brainstorming generated questions which proved hard to answer, and pupils risked becoming frustrated. We therefore converted information we had into questions. Using their research, children then invented and advertised their own Aloe vera product.

We used role play to hold a debate between parties involved in the process from growing to selling. This was an exciting way to express ideas from previously unknown viewpoints. It developed empathy. These were suggestions for some of the Aloe vera growers' demands:

We want a school, food supplies, 50% of the profits, medical supplies, a set of housing built by you, education, and business. Also 10 years of income tax for our field of Aloe Vera.

At Albert Bradbeer, we used a brainstorm to generate questions. We then grouped these using the development compass rose, and from this produced a questionnaire about Brazil nuts.



QUESTIONNAIRE

1 What company packs the Brazil nuts when they have been transported to Britain? _____

2 Is it male, female or both that collect the nuts?
male ☐ female ☐ both ☐

3 What method of transport is used to bring Brazil Nuts to Britain? _____

4 Do children work in the Brazil nut factories? If they do, from what age? yes ☐ no ☐ age ☐

5 How much does the average transportation cost? _____

6 How much does the Government charge to have the nuts transported into Britain? _____

7 What companies pack the Brazil nuts? _____

8 Are the Brazil nuts cheaper in Brazil than Britain?
yes ☐ no ☐

9 Which people harvest the Brazil nuts? _____

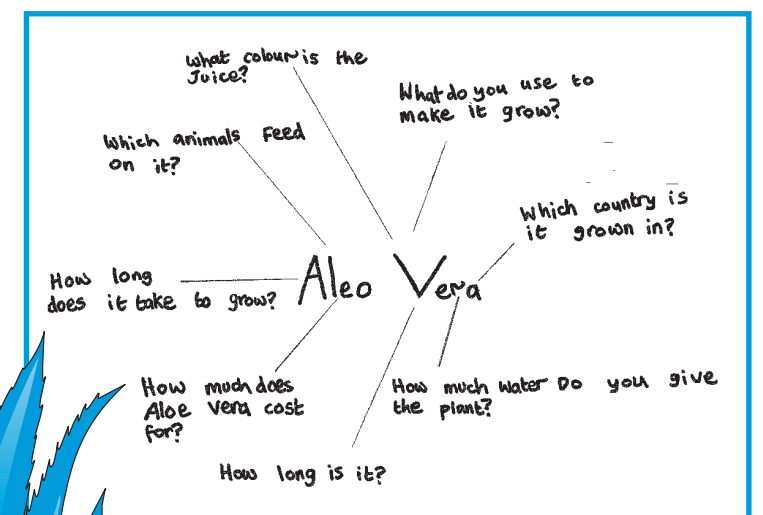
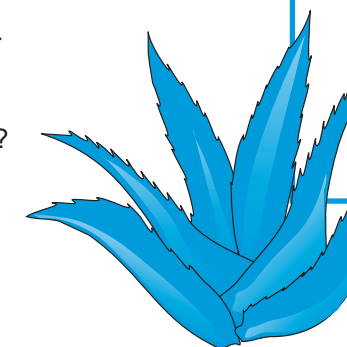
10 How many tonnes of Brazil nuts are transported from Brazil each year? _____

Children's questionnaire

At Nansen, Year 3 classes interrogated the packaging of selected products, eg toothpaste, shampoo, soap, hair conditioner. We focused on the ingredients. What was common to most of the products? Aloe vera!

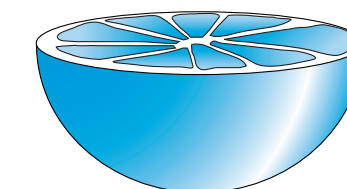
We then asked: what do we know about Aloe vera? What would we like to know? In groups of four to six we brainstormed questions we would like to ask eg: What shape are its leaves? What colour is it? Where is it grown? How can we find out the answers to these questions?

We then used a visit to the Birmingham Botanical Gardens to pursue the answers to these questions.



"brainstorming is a way of children coming up with ideas without having to worry about it being right ... without qualifying it, and knowing it will be valued."

At Conway, we asked the grapefruit questions!



For example; "Who eats you?" "Who grows you?" "Where do you grow?" "How much money do people get for growing you?" "How much does it cost for us to buy you?" "How do you get to us?"

This led to discussion about issues of sustainability.

Finding information

The big challenge was to identify sources of information to answer the questions generated. We wanted to develop the children's research skills - how could they find out?

Having chosen our specific plants, we knew that this might be a challenge. We also knew that children would encounter conflicting information [eg from companies and charities]. We wanted the children to realise not only that some answers were complex but that there wasn't always an accessible answer. The answer to one specific question might itself generate more questions.

We began by brainstorming possible sources of information with children

Product information on packaging provided the first port of call. Other information came from books, CD-Roms, internet sites, specific companies, contacts at development education centres, botanic gardens, charities ...

"The information books which were provided weren't usually used at the school. The fact that the children used them and were able to locate information in them proved that our expectations had sometimes been too low."

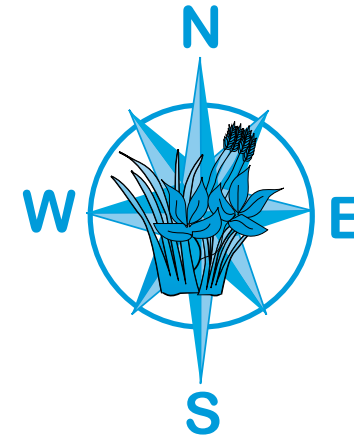
One teacher conducted the research with a group of children with special needs. She found that the children used books beyond their usual ability, and took particular interest and pride when they used her own books from home. She found herself impressed by the way they worked



There is a list of ideas for sources of information, including published materials and websites, in the back of this book.

"We found that they were processing information at a high level"
"It was a learning process for teachers and children"
"We used a variety of materials, from simple picture books and dusty encyclopaedias to the internet. What's more, the children used sources we hadn't thought of."

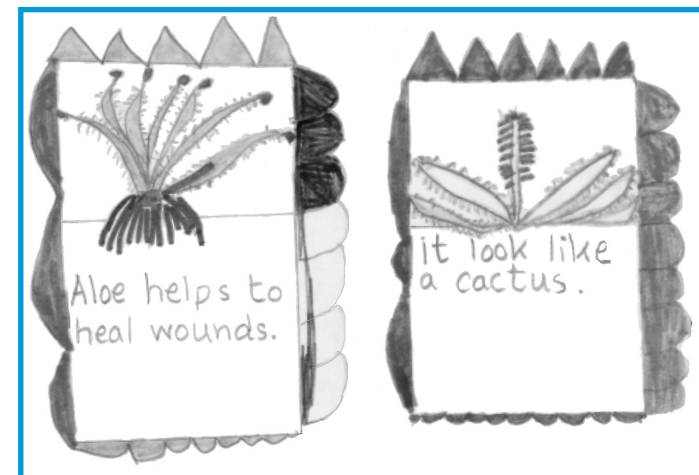
Finding information on plants



Our stimulus visits acted as a springboard, which allowed for primary observations and information about a range of plants on site. Children had to locate the plants in their specific environments and use provided information and direct observation to compile basic facts.

'Plant Passports' were then used to focus attention on a specific / chosen plant.

This was easily accessible information which was later made into an individual fact file, using books and ICT resources. The information was collated by the children, which informed their decisions for their requirement for further data. The fact file included a glossary of technical terms



The children were then able to draw on sources relating to their plant, to expand their now growing knowledge on the subject. These sources were selected by both teachers and pupils. The quality and accessibility of this information was variable.

A representative from a pharmaceutical company came to discuss Aloe vera plants and products with the children.



"The information they got here at school was supported by the experience of a visit. Having hands-on, directly experienced, primary information made it much richer ... especially for lower ability children: simple things like experiencing temperature change and humidity."

Shopping

We took the class to the local shops to buy grapefruit. The local supermarket did not sell fresh grapefruit. They only sold tins of grapefruit in syrup. We asked the manager why they did not sell fresh grapefruits. He said that there was no demand for them.

We then went to local greengrocers shops. We were able to buy fresh grapefruits. We returned to school and sampled some fresh grapefruit. Not many of the children had eaten grapefruit before.

Another avenue of enquiry involved jotting down the names of suppliers from the fruit boxes on display at the shops.

"We were due to study plants in science. Having learned about grapefruits being a cross of two different plants, and having seen the plants, this became really fascinating to the children. They were especially amazed that grapefruits didn't exist a century ago. Concepts like cross-pollination and hybridisation became things they were genuinely curious about."

Finding information on trade & products

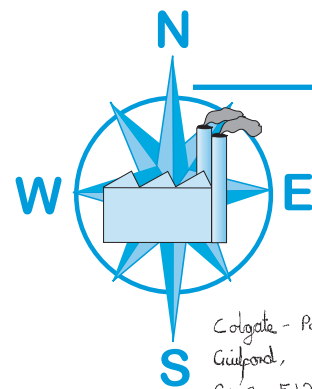
What we did

The brainstorms led to specific questions which the children formalised in different ways:

- letter writing to companies/charities
- devising questionnaires with accompanying letters
- e-mailing companies
- internet enquiries

How did companies respond?

- The response was varied!
- Some information arrived quickly
- Other information arrived very slowly
- Nearly all information was of a general 'marketing' nature and was not directed at a young / child audience
- Questionnaires were generally disregarded



Wyndcliffe Junior School,
Little Green Lane,
Bordesley Green,
Birmingham,
B9 5BQ,
9th January 1999

Colgate - Palmolive,
Guildford,
GU2 5LZ.

Dear Sir/Madam,

My class are working on a project about palm-oil. We have been researching on a palmolive soap. We would like to know all that we possibly can on the project.

We want to know if the palm oil is from Kenya, and how it gets here? How do you get the soap all frothy? What part of the plant does the oil come from? How does growing and producing palm oil in Kenya affect the local community? If you have any replies please write back. Thank you very much.

yours faithfully
Nargan.

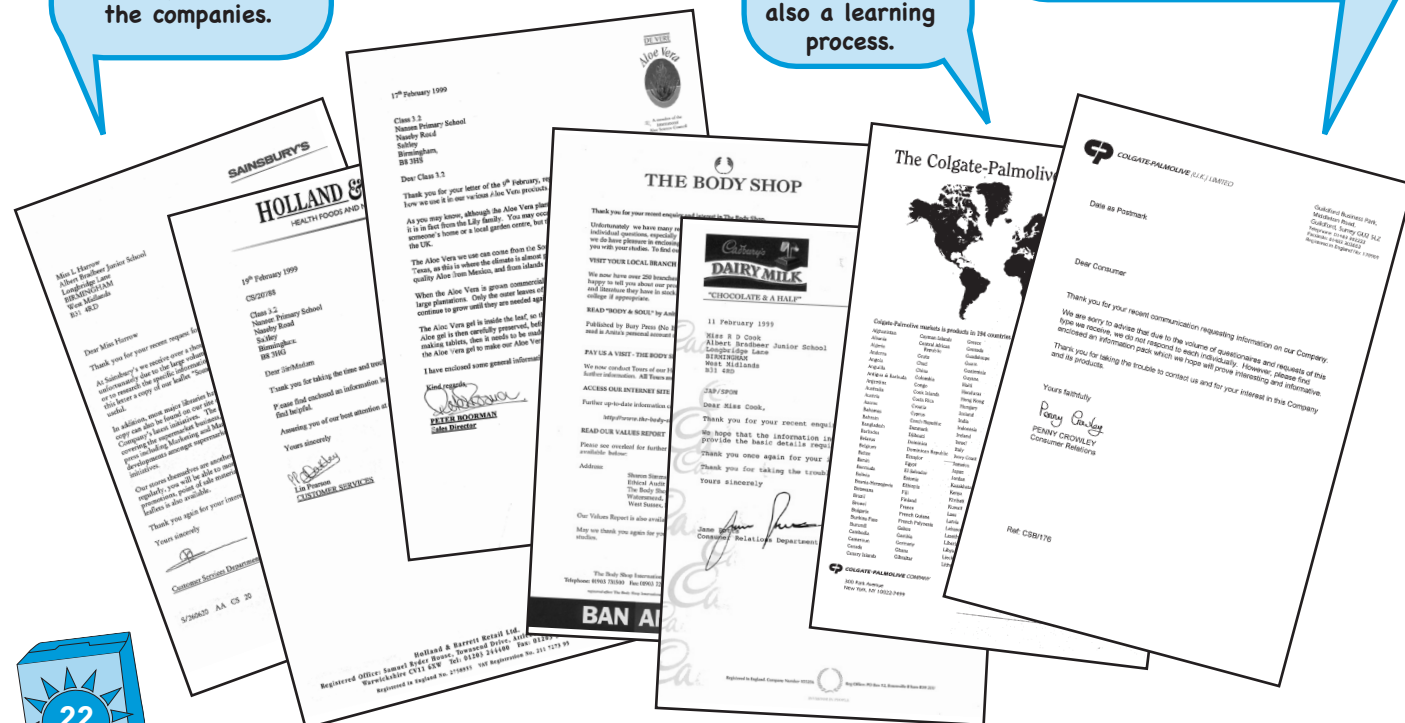
They were very excited to get responses, especially ones addressed personally.

Del Monte were very helpful in giving us information about the grapefruit-juice-making process

The children wanted to track prices back to the grower but the companies wouldn't give the information ... one child said she reckoned they didn't want us to know how much profit they were making. The others agreed.

My class was disappointed with the response from the companies.

Not getting a direct answer is also a learning process.



How did charities respond?

- The charities' response was more directly informative / linked to the issues raised
- Some information arrived slowly
- Some information arrived quickly
- The information was very interesting. Sometimes it had a political bias
- Questionnaires were generally disregarded

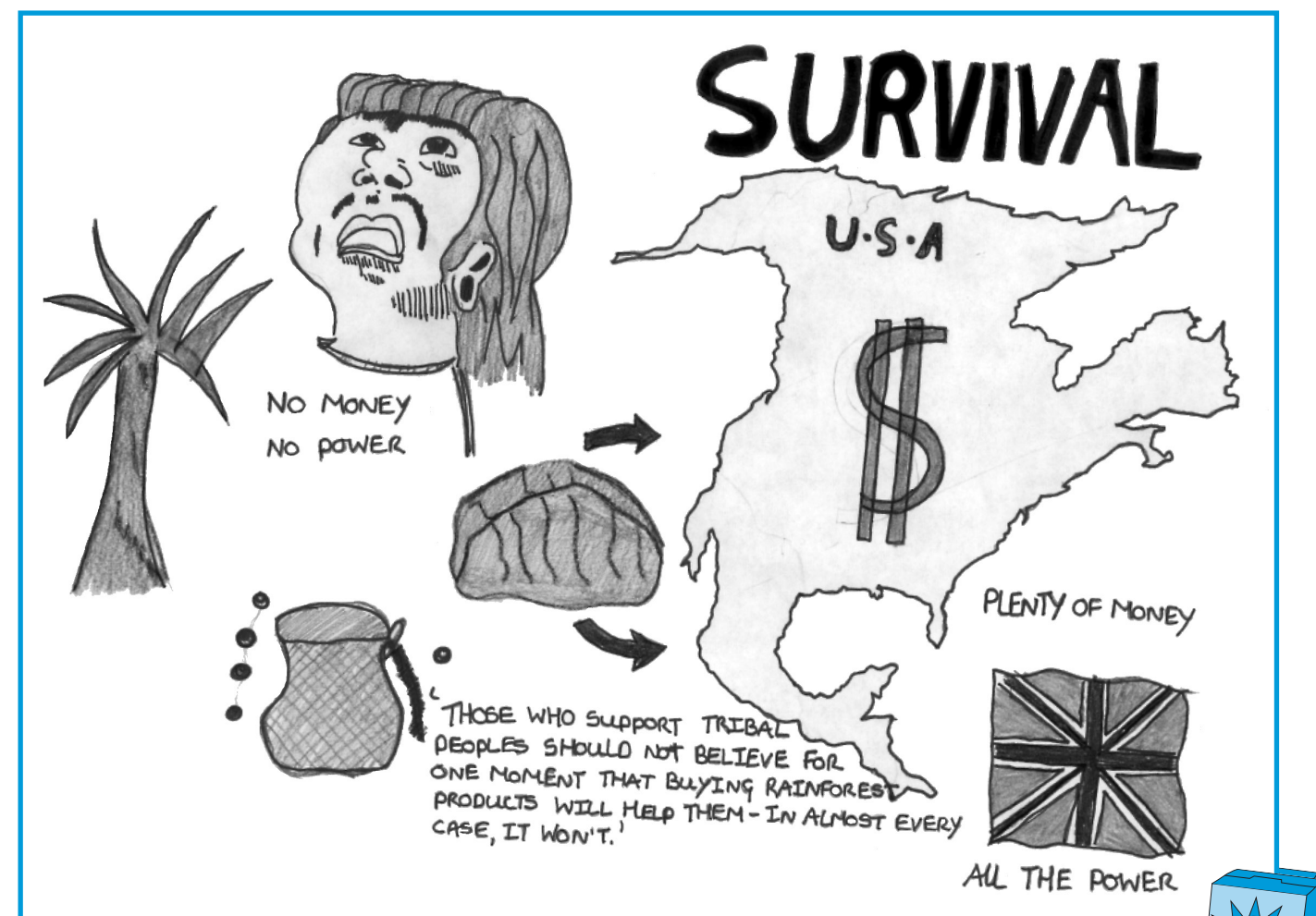
Using the information

"At Conway, children helped each other write to supermarkets, Del Monte, and also to embassies. We found that embassies were good for country information, but not for data on products. We feel that contacting them will be a low priority next time.

"Of course, it was interesting for the children to learn about the work of embassies, but it did not give much of an insight into sustainability and grapefruit in each country. They did not really learn much about the people but it did make them aware of issues relating to people who worked growing grapefruits etc."

"Making questionnaires was very useful. The children considered the purpose to be a real one ... we'd still do it the same way again"

"At Albert Bradbeer we looked at information from The Body Shop and Survival International about 'Rainforest Harvest' products and produced powerful posters as a result. We may now go back to the Body Shop in order to draw out further information."



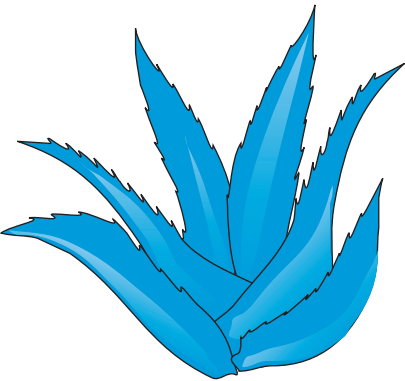
Places and people

Presentations

At St Brigid's and Nansen we used atlases and associated geography skills to locate some of Aloe vera's places of origin.

We showed children a video provided by a cosmetic company which identified a policy of 'vertical integration' at a Dominican Republic village where Aloe vera was grown. The workers in the field were all local, and growing and processing was done at the village. Children pointed out that although the aloe was processed there, it was shipped to South America for packaging and retail.

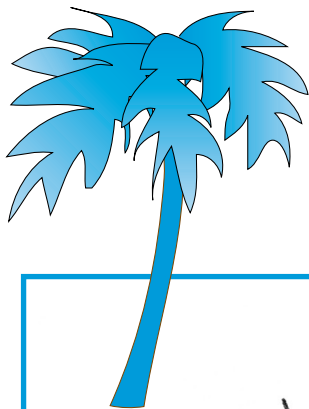
A speaker then visited us and spoke about Aloe vera, which stimulated further interest in the children. One thing they found was that Aloe vera waste was recycled - back into the land - and this led to a general discussion about recycling and composting.



"With a bit of detective work, children can use photo materials, atlases etc. to build up a sophisticated picture of issues for growers and their communities, and what life looks and feels like in those places."

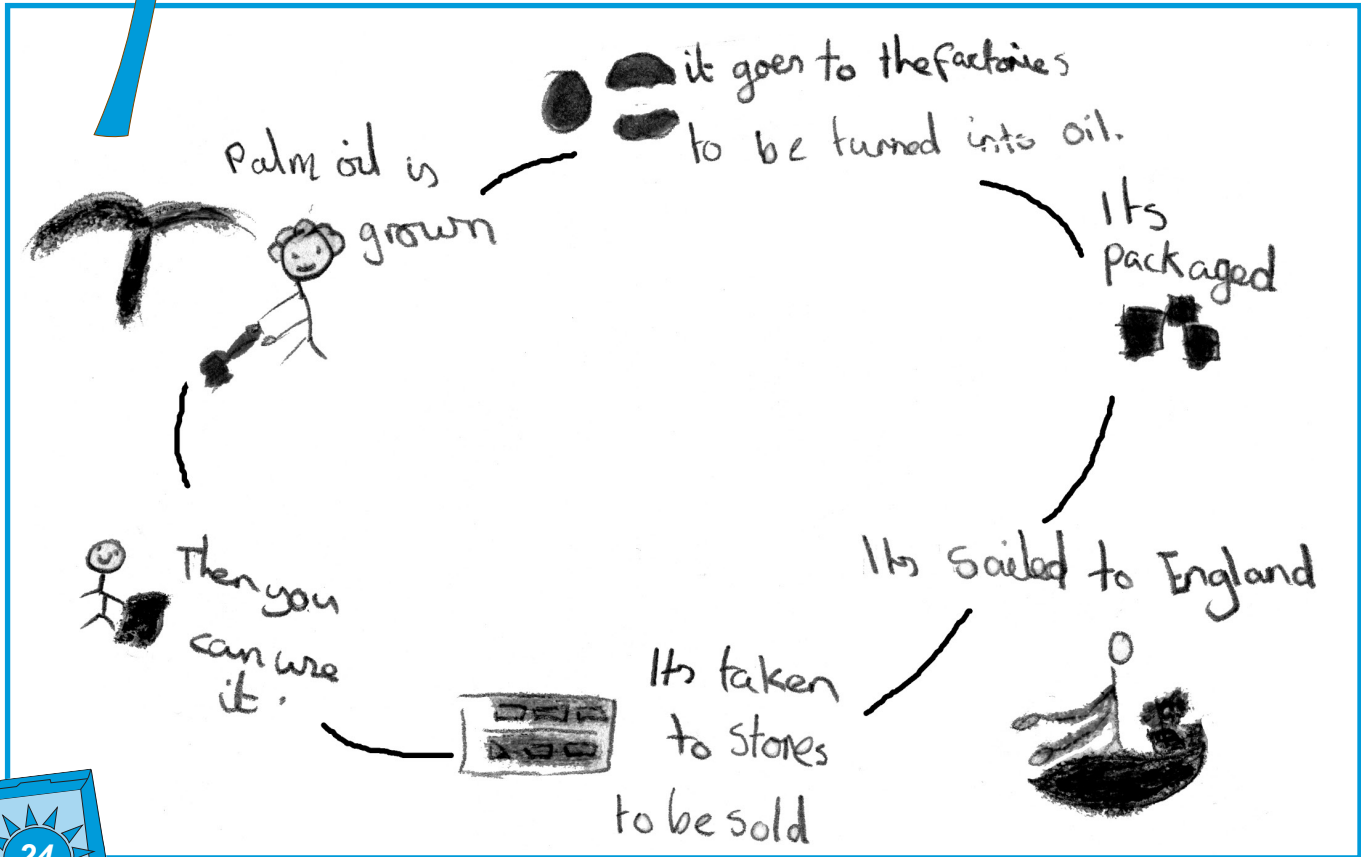
"A lot of information was screened. Companies often only wanted us to have positive images. They didn't give much on the place and people."

"It has been hard to make direct contact with growers, although charities and unions sometimes speak for them."



CONCEPT MAP

We considered how palm oil reaches our country and who might be involved in the whole process.



Company information

Most of the companies that we dealt with were used to dealing with retailers. Consequently they were unable to supply information regarding plants' origins and the early stages of harvesting.

Other sources of information might include:

- NGOs working with growers and their communities
- unions and trades associations representing growers
- photopacks [and other country/place resources] - offering information and images about the places where the plants are grown
- use of internet chat rooms
- video conferencing
- twinning schools - sharing information
- educational visits
- e-mail links
- families and the community links
- trade magazines and websites



"We did receive responses from importers of grapefruits. The information they sent was informative to the children and teachers. The replies did not give us details about the people who actually work harvesting the grapefruits."

This could be researched into more by getting in touch with trade associations and unions."

Land use - a simulation

Now

- Your family owns an allotment area but never uses it. Business people have offered you £10,000 for the land, which they intend to develop into a supermarket.
- You discover that other owners who use their allotments [to help feed their families] do not want to sell their plots.
- Out of 26 allotment owners, 10 owners want to sell, 10 want to keep their land and 6 are undecided - you are one of the six.

Twenty years later

In the end, the developers bought the land, with 14 people agreeing to sell initially. To persuade those against selling the developers increased their offer of £10,000 to £15,000. After a further six months of negotiating, everyone agreed to sell.

INFORMATION

ACTIVITY

- Think carefully and discuss the matter with your friends - £10,000 is a lot of money!
- Write down a list of reasons for selling to the developers
- Write down a list of reasons for keeping the allotment
- Can you think of an alternative to selling to the developers considering that you do not actually use the land?
- Make a decision and justify it - write a letter to the developers informing them of your decision.

Next we will consider the effect of your actions in 20 years time!

- How did you spend the £15,000?
- The supermarket is still on the site. Who do you think benefited most from the deal?
- Who do you think produces the goods that are on sale at the supermarket?
- Do you think that the workers earn much money?
- How do you think the local environment has changed as a result of this transaction?
- Can you see how a decision made here can alter the lives of people in a different part of the world as well as in our immediate environment?
- Use the table to sort out your ideas. You may draw pictures to illustrate your thoughts too.

Children at Wyndcliffe considered a local land use issue - now and in 20 years time. They read a variety of texts for information and to raise issues, including extracts from Walter Rodney's **How Europe underdeveloped Africa**.

Role play

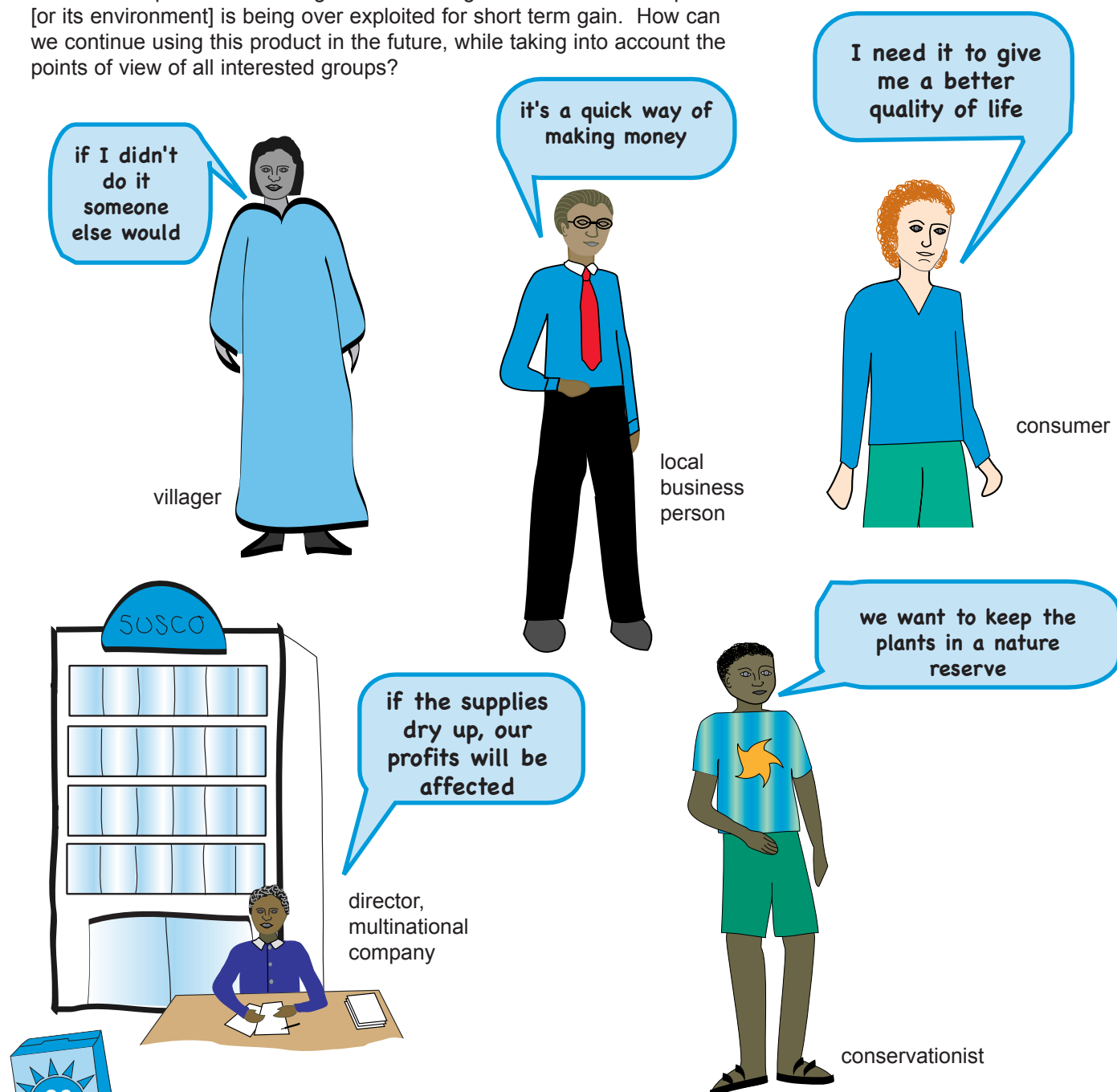
At St Brigid's and Wyndcliffe we found role play a useful way to learn about sustainable development, because it allowed us to explore real life issues in the classroom :

- creating debate
- introducing differing perspectives
- helping children understand each other's point of view
- highlighting that real life issues are complex
- illustrating that conflict can be resolved
- airing the notion there may be short term losses so that future generations will benefit

Setting the scene

A useful raw product is in danger of becoming extinct because the plant [or its environment] is being over exploited for short term gain. How can we continue using this product in the future, while taking into account the points of view of all interested groups?

"To introduce this activity, you could copy the statements and ask the children to match each statement to the person they think it fits. What reasons can they give for their choice?"



The Aloe vera argument - outcomes from a role play.

At St Brigid's, children conducted a passionate debate - in various roles - about the growing and sale of Aloe vera. They then worked together to write up the main arguments for each role, together with a summary report from their own point of view, as follows:



My report on the debate of Aloe vera

"I think that the medical company had no right buying all the Aloe vera off the farmers, because when the farmers run out of money it would take some time to grow the Aloe vera back, so the farmers would be in a mess. Why can't the medical company find a new cure for cancer, so they would not have to take all of the Aloe vera? If the medical company build factories in the countryside it will damage the plants because of the pollution, and they would also need to build roads, so that would also damage the countryside."

What have we learnt?

At the end of the investigation, we felt it was important to take stock of what we had learnt. We wanted to:

- consider how successful we had been in answering our questions ... and why
- recognise what we had learnt ... including the process
- celebrate what we had done
- think about how we might use that learning

This took several forms:

Children

- considered 'highlights' of Waking up [see also page 30]
- reflected at the same time on what they had learnt
- discussed some of the underlying principles of sustainability - what does it all mean?

Teachers

- reflected together on Waking up, in the process of drafting a joint description of their work for other teachers [the basis of this publication]
- considered their own [individual and collective] learning and professional development as a part of this
- commented individually on aspects of Waking up which had particularly mattered to them [included in italics throughout the text]
- considered classroom activities in the light of education for sustainable development [see pages 6 and 7]
- shared thoughts about children's learning outcomes - both in a general sense, and in relation to curriculum areas

Children's thoughts on Waking up

"I liked it when we were pretending to sell our allotment to the developers. I liked asking and answering questions. I also liked writing my Waking Up Poem. I didn't realise how many plants we used in the morning."

"We loved going to the Botanical Gardens. Best of all I liked Old Man's Beard and the plant that smells like Tunes."

"We did Product Posers. We asked shampoos, soaps and toothpastes the kind of questions that you'd ask people. That was my favourite part of the project. Then we wrote letters to companies that made the products to find out how they sustain them. We didn't get very many answers. We got more information from books than people".

[From 5G, Wyndcliffe Junior]

Children were able to consolidate their research on plants and locations with real life experience at the Botanical Gardens.

Children used secondary source material appropriately - skimming, scanning and reading the text to gain relevant information.

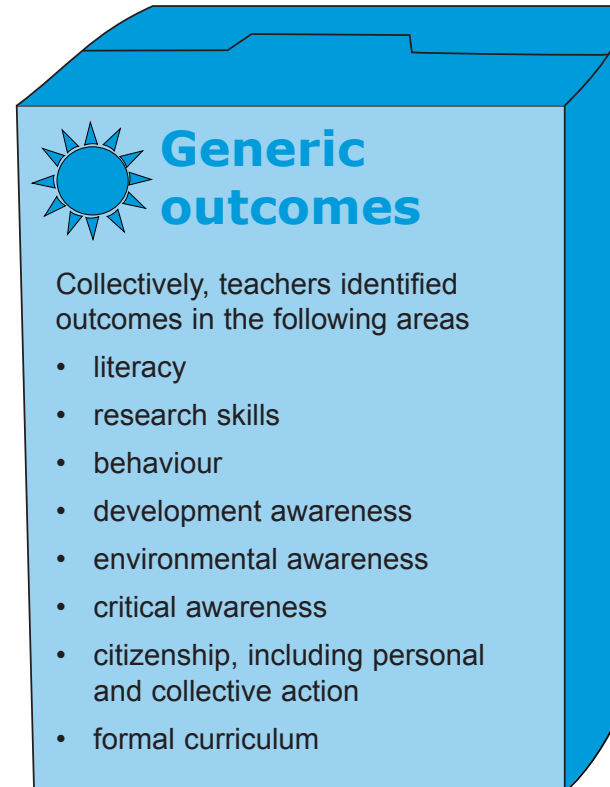
Children are aware, now, that there are no easy, one-way routes to sustainability. They are able to consider more than one point of view and value the opinions of others.

Children are beginning to understand 'cause and effect' and are able to see that a decision they make now could affect the lives of others [for better or worse] in years to come.

Children are beginning to articulate their opinions with more maturity and to listen patiently to those of others.

Teacher comments from Wyndcliffe

Children's learning outcomes



Pupils learnt about ethical issues of workers which they would not normally have learnt about. Their discussion skills have developed well and their ability to debate issues is very good. The children are able to refer back to issues of the project in their present Geography work on St Lucia.

We have been able to gear our teaching of the Geography topic to a lot of drama and discussion about why a certain place produces a certain product, and all of the effects it has on cultures and standards of living.

Teacher comments from Conway



Curriculum outcomes

- Literacy - Letter writing: wrote to supermarkets, citrus juice producers, embassies, shops such as Body Shop. Children had to produce letters. They received letters which we read and these created much discussion. Children were very excited when they received letters.
- Questioning skills - initial activity in groups. The letter writing also focused the children to ask searching questions.
- Research skills - The children were very keen to go through a variety of books, using contents and index pages to find the information on grapefruits. They loved it when they found something.
- Skimming - Children had to practise their skills of skimming text to locate important information.
- Speaking and Listening - The project allowed for a lot of sessions where we had to discuss and listen to other people's ideas.
- Science - healthy eating, plants and pollination
- Health education - healthy living
- Geography - Physical landscape and climate influencing trade. Map reading - trade routes on World maps
- R.E. Harvest assembly - Fair trade
- Drama - Hot seating - e.g. owner of grapefruit plantation, freeze frame, role play
- ICT - A group of children used the Internet to find information about the grapefruit. This was not particularly successful for finding information but the experience was valued as it taught the pupils how to use the Internet as a research tool.

Conway

- Technology - Brazil nut box, poster
- Art - mask of rainforest animal
- Literacy - using writing frames for poems, making a diary based on Paul Hunt's 'Night Diary' structure - applied to Amazonian Rain forest animals
- Citizenship - poster - linked to Christian Aid publicity - campaign poster

Albert Bradbeer

Children's evaluation

Children created boards - in words and pictures - to describe the most important things that they felt they had enjoyed, experienced and learnt. This endorsed and reinforced what they had got out of the investigation process. It also encouraged reflection about the meaning of what they had learnt.

Children working on Brazil nuts also brainstormed what a world without rainforests might look like - again, exploring and recording part of the meaning of what they had learnt.

Brazil Nut Evaluation

I think the rainforest should be preserved. We obtain so much from the rainforest so why cut it down. We have wood to make beautiful furniture, such as chairs, knife handles, tobacco boxes, tables and walking sticks. We also use Mahogany, which is very hard wood, we use it for door frames, window frames and doors. We also receive foods which we cannot be without like salt, pepper and sugar which is found in cakes and biscuits. We receive vanilla, coffee beans and cocoa beans which we use for chocolate drinks and plain chocolate.



I also particularly enjoyed writing arguments, you probably know I don't agree with forests being cut down as this piece from my History book will tell you.

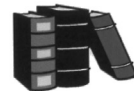


I enjoyed making the rainforest night dian'es.



I enjoyed the trip to the Botanical Gardens we found out about rainforest plants.

I enjoyed making rainforest collages it was fun but it was quite hard.



We found that reading books was a good way to find information.

The air will become polluted and it will be hard to breathe

We won't get some foods like Brazil nuts. Cocoa beans Coffee beans Peppercorns.

The soil will dry out and block up rivers. we need wood for paper.

We will lose all the medicines we receive from the rainforests.

A World Without Rainforests.

Resources and sources

Information tree

The US sold nearly 21 million gallons of grapefruit juice to other countries ...

Jan to Sept 1999
[Foodnews, Jan 14th 2000]

Grapefruit

Products: Juices, foodstuffs, seed extract and oils for shampoos, shower gels etc.

Where grown: USA, Caribbean [including Belize], Israel

Information sources: www.agra-food-news.com [for suppliers list]; www.chem.uwimona.edu.jm:1104/ lectures/citrus.html [jamaican citrus]; http://gnv.ifas.ufl.edu/~fairweb/text/ch/22992.html [grapefruit history]; www.miracure.com/ [grapefruit psoriasis cure]; www.yahoo.com or http://uk.yahoo.com [you can search on the word "grapefruit" to link to dozens of growers' sites]



Our children were amazed at how complicated it was to get grapefruit juice. They were particularly intrigued that it had to be turned into concentrate for shipping, and was then topped up with water. It raised a lot of questions.

Brazil nuts

Products: cereals, chocolate bars and other foodstuffs, extracts used in some bath oils etc.

Where grown: South America - Brazil, Peru.

Information sources: www.agra-food-news.com [for suppliers list]; www.the-body-shop.com [includes interactive questions and answers web page - plus information on "rainforest products"]; www.survival-international.org [survival international - a critical view]; www.nri.org [tropical forest forum]; www.antenna.nl [onward links, including factsheets on main producers etc.]; www.tradezone.com [aimed at investors]; eco-adventure.magnet.com/disc [general information for children]; http://uk.yahoo.com/ [a search on "brazil AND nut" uncovers numerous useful websites].



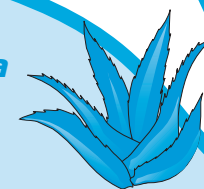
Trying to understand the ethical issues surrounding trade was important to us.

Aloe Vera

Products: Shampoos, moisturisers, conditioners, shower gel, tonic drink

Where grown: East Africa, Mediterranean, Dominican Republic ...

Information sources: www.the-body-shop.com [includes interactive questions and answers web page]; www.aloe-vera.org/



One of the big questions for us about Aloe vera in the Dominican Republic was who controlled the process. If local communities could process it as well as produce it, they stood to make more profit, and to do so in a more sustainable way [for example, by composting unused parts of the plant]

Many questions about: how far our food has to travel; why most money is made by shops and processors, not growers.

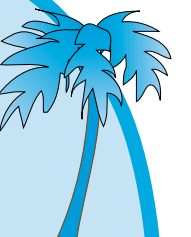
Palm oil

Products: Soaps, detergents, palm wine [in West Africa], sweets, snack foods, fuel oil, cooking oil and other goods.

Where grown: West Africa, Malaysia, Indonesia, Papua New Guinea

Information sources: VSO [Tel. 0181 780 2266] produce a teaching resource "Solids, liquids and gases using palm oil"; www.antenna.nl [for information on Sawit Watch, who oppose new large scale plantations in Indonesia]; http://uk.yahoo.com/ [a search for "palm AND oil" uncovers numerous useful websites]; www.corporatewatch.org/ [for a critical view and onward links to campaigning groups]; www.earthisland.org/borneo/ [for interesting campaigning information about palm oil production in Sarawak].

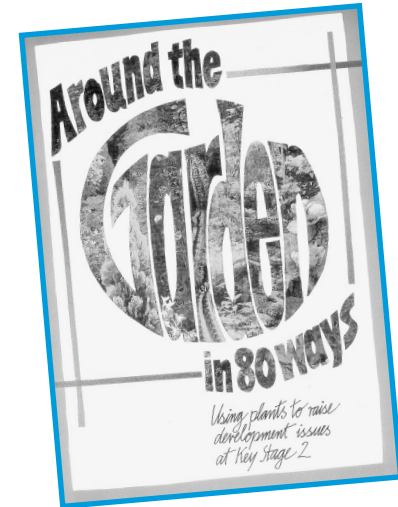
Who owns the land? Who makes the decisions? Those were the most important questions for us when we looked at palm oil.



Resources

Plants and products

Around the garden in 80 ways *Using plants to raise development issues at key stage 2*, Tide~DEC/ Birmingham Botanical Gardens Base, 1994



Farming, local and global Scottish DEC, 1995

Food for thought *Planning a primary topic on food and development*, Ange Grunsell, Oxfam, 1991

Food matters *The question of food in the world*, Tide~DEC/ Trocaire, 1992

Green inheritance [and Green inheritance teaching pack] Anthony Huxley, WWF, 1984 [pack - 1991]

Making a meal of it! *A photaset and activity pack for 7 to 11 year olds, looking at food issues around the world*, Louie Fooks, Oxfam, 1998

People, plants, and places Julian Ageyman, Learning through landscapes, 1995

Plants for people Anna Lewington, Natural History Museum.

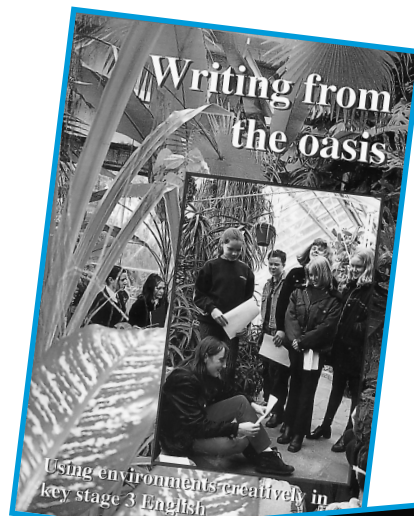
Sowing and harvesting *Activities for 7 to 11 year olds, looking at food, farming and trade*, Rebecca Sudworth, Oxfam, 1998 [2nd edition].

We are what we eat - but who controls our choice? *An active learning project on food and nutrition*, Heather Jarvis, Unicef, 1988

Where does our food come from? Poster / activity resource. Oxfam/Christian Aid, 1989

The whole world cake *A resource for use with 8 to 11 year olds about where our food comes from*, Ruth Lewis, Christian Aid, 1994

Writing from the oasis *Using environments creatively in key stage 3 English*, Tide~DEC/ Birmingham Botanical Gardens Base, 1998



Sustainable development

Lessons in life: resources for primary schools Christiane Dorion and Patricia Kendell, Council for Environmental Education, 1999

Emily's journey - sustainable development in Britain and Brazil, Hull DEC, 1993

Imaginative leaps *Creative arts and sustainable development*, Paul Bradbury and Sheila Harding, DEC [S Yorks], 1998

It's our world too *A local-global approach to environmental education at key stages 2 and 3*, DEC [S Yorks]/Tide~DEC, 1992

Literacy through the environment *A compilation of ideas for incorporating literacy into educational work in the environment*, Ed. Rosie Edwards and Ron Wilson, National Association of Field Studies Officers, 1999

Pachamama *Our earth - our future*, Peace Child International/ Evans, 1999

Rescue mission planet earth - a children's edition of Agenda 21, Peace Child International/ Kingfisher, 1994

Where we live *Exploring local-global environment links*, Andrew Simons and Scott Sinclair, Tide~DEC/WWF, 1992

Window Picture/story book Jeannie Baker, Red Fox, 1992

Investigations

A development education guide to the world wide web Poster and supporting materials. Tide~DEC/80:20, 1998



A world of investigations *A science photopack for key stages 1 and 2* Tide~DEC, 1996

Contacts

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Botanic Gardens Conservation International Descanso House 199 Kew Road Richmond Surrey TW9 3BW Web: www.rbgekew.org.uk [botanical information]

Council for Environmental Education 94 London Street Reading RG1 4SJ Web: www.cee.org.uk [includes educational case studies]

Environmental Policy Department **Department for International Development** 94 Victoria Street London SW1E 5JL Web: www.dfid.gov.uk

Envirolink Web: <http://envirolink> [onward links etc]

Farmers' Link 38-40 Exchange Street Norwich Norfolk NR2 1AX

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This publication is a contribution to Forward Thinking.

The Forward Thinking initiative has provided a variety of opportunities for teachers to work together to plan, implement and evaluate work which responds to the challenges facing us as we seek to meet the educational needs of young people growing up in an increasingly global context. Among the challenges – and creative teacher work – has been educational thinking around the idea of sustainable development, locally and globally.

For information about Tide~ initiatives contact: Teachers in development education/DEC, 998, Bristol Road, Selly Oak, Birmingham B29 6LE. Tel 0121 472 3255. Website: www.tidec.org





When we get out of bed every morning, wash, dress, eat breakfast and brush our teeth, we are entering a relationship with plants from around the world.

This resource takes a few everyday items and investigates issues of sustainability for plant materials used in them - such as Aloe vera and palm oil.

The emphasis is on teachers and pupils as researchers - writing letters to companies, using IT and applying book based skills. It also includes using the stimulus of a visit to look at the source plants and make connections with the places they are grown.

Practical activities lend themselves to classroom work on a wide range of curriculum opportunities, including science, geography, ICT, citizenship and literacy.



*In partnership with the
Botanical Gardens and the
Botanical Gardens Base,
Birmingham LEA*

Teachers in development education
Tide~
DEC [Birmingham]