



Secondary School Teaching Resources





Welcome to Chelsea's on-line teaching resource.

Chelsea Sugar is pleased to provide you with class materials which link to the **Social Studies Curriculum**. We are confident that it will be a valuable addition to your teaching programme and provide exciting and challenging tasks for your students.



Our education site is targeted at students in both primary and secondary schools. You will find lesson outlines and a variety of resources directly linked to the curriculum. Each lesson is based around the key skills and ideas from the “front end” of the curriculum document including key competencies and conceptual understandings.

The content of these lessons involve local study material about a well known New Zealand brand. Experienced classroom teachers have put the lessons together with literacy, the curriculum and student interest in mind. These resources can be downloaded in PDF using the links provided, video clips and power point presentations are included in the resource.

Sugar is an important part of the New Zealand lifestyle and Chelsea an important cultural brand. This is a case study that fits well with the achievement objectives. All four conceptual strands are covered – culture of sugar, the history and change of an iconic industry, the impact of Chelsea Sugar on places and the environment and the economic impact and innovation of this long established company are all featured in these resources.

We hope that all the information provided is useful and enjoyable to use as part of your lessons.



Social Inquiry Overview - Sweet As

A starter for you to finish...

Focus of learning/topic

- Place and Environment
- Sweet As - The World of Sugar!

Concepts

- Business
- Place
- Environment
- Change
- Trade
- Enterprise/Innovation
- Community

Conceptual Understandings

- Economic decisions impact on communities.
- Sugar reflects innovation and enterprise.
- Managing resources impacts on the social and environmental sustainability of a community.

Considering Responses & Decisions

Reflecting and evaluating

Finding out information

- What is the Chelsea Sugar Refinery?
- How does this business impact on communities?
- How do consumers interact with Chelsea?
- How does Chelsea show innovation and enterprise?
- What resources does Chelsea use?
- How does Chelsea minimise environmental impacts and help promote sustainability?

Exploring values and perspectives

So what?

So what do we now know about this?

So what does this mean for us/others?



Now what?

Now what further learning do we need?

Now what might be done about it?

The Social Studies Curriculum

What are the three key aspects when planning in the future...

The Essence of Social Studies

- Developing ideas about Society.
- Participation in Society.
- Understanding the Personal and Social significance of the ideas.

The AOs (Conceptual Understandings)

- Understand how economic decisions impact on people, communities and nations.
- Understand how people seek and have sought economic growth through business enterprise and innovation.
- Understand how people manage resources for environmental and social sustainability.

Social Inquiry

Social Inquiry is different from an inquiry.

It has 4 key parts:

- 1) The Inquiry.
 - 2) The 'old' social decision making.
 - 3) Values and perspectives.
- AND
- 4) Social & personal significance.

The Key Competencies, Values and Principles

Thinking, language-symbols-text, managing self, relating to others, participating and contributing.

Sweet Starters: Blind Taste Test

Collect a range of different types of sugar. Some examples could include white sugar, icing sugar, brown sugar, raw sugar, caster sugar and even some more exotic sugars like Demerara sugar.

Blindfold students in the class (cut up a piece of material).

Place piles of the sugar on plates and give students an ice cream stick or teaspoon.

Students to go to each sugar plate and 'guess' the type of sugar found there.

The winner (person who identifies the most correct sugars) could be awarded a 'sugar sweet' prize.

Could be done in small groups and student helpers can organise the plates of different sugars.

Discuss as a class...

- What sugars were easy to identify?
- What sugars were hard to identify?
- What products would you find these products in?
- How often do you use them at home?
- What sugars are not used often? Why?
- Why are there so many different types of sugar?
- What other types are not found in the test?



Sweet Starters: Design a Recipe Competition

There are two parts to this activity:

Firstly:

Students to design a recipe that uses Chelsea products.

Students must:

- Use at least 2 Chelsea products in the recipe.
- Have ingredients, method, and serving suggestions.
- Have an original recipe that is not directly copied from a book.
- Present recipe with appropriate layout and images.

Secondly:

Students to cook / bake the food using the recipe.

Students to bring their food product to class and it will be judged.

Aspects of judging could include:

- Taste
- Presentation
- Originality
- Size and Shape
- Cultural Icon

Could be used as a fundraising activity for a local project or charity, etc.

Students to sell their projects during a bake sale, etc.



Sweet Starters: Find Someone Who...

<p>...likes to eat sweets and lollies.</p> <p>Name:</p>	<p>...has visited Chelsea Estate Heritage Park in the last year.</p> <p>Name:</p>	<p>...bakes at least once a week.</p> <p>Name:</p>	<p>...favourite flavour is strawberry.</p> <p>Name:</p>
<p>...had sugar on their breakfast cereal this morning.</p> <p>Name:</p>	<p>...knows what Caster Sugar is.</p> <p>Name:</p>	<p>...has made jam before.</p> <p>Name:</p>	<p>...knows what colour the Chelsea Sugar factory is.</p> <p>Name:</p>
<p>...has more than 3 types of sugar in their pantry.</p> <p>Name:</p>	<p>...has had pancakes and maple syrup recently.</p> <p>Name:</p>	<p>...has fed ducks at the Chelsea Heritage Park.</p> <p>Name:</p>	<p>...knows where sugar comes from.</p> <p>Name:</p>
<p>...loves candy floss.</p> <p>Name:</p>	<p>...has to watch how much sugar they eat for health reasons.</p> <p>Name:</p>	<p>...knows what GI means.</p> <p>Name:</p>	<p>...knows what a carbohydrate is.</p> <p>Name:</p>
<p>...adds at least 2 teaspoons of sugar when they make a Milo drink.</p> <p>Name:</p>	<p>...keeps their sugar in the fridge.</p> <p>Name:</p>	<p>...knows someone with Diabetes.</p> <p>Name:</p>	<p>...can make fudge.</p> <p>Name:</p>



Level Five

Lesson: Introducing Chelsea Sugar Refinery

Focus of lesson / Activity:

Understand how economic decisions impact on people, communities and nations.

Essential Question:

What is Chelsea?

Concepts: Location

Industry, Change, Growth, Resource, Location.

Level 5: Key Competencies.

Using language symbols and text:

Students to use literacy skills based on DVD and text, create a glossary, develop a timeline, etc.

Thinking:

Students to think about key ideas and relevant questions.

Resources needed:

125 Years of Chelsea clip.

Literacy worksheets.

Lesson Outline:

Students to watch the 125 Years of Chelsea clip.

Students to complete the literacy activities provided.

- History of Chelsea – paragraph identification.
- Concept sort – different reasons for location.
- Question writing.
- True or false.
- Making a history road.

All activities available on handouts.

History of Chelsea Sugar Refinery

1. In 1882 the New Zealand Government offered a bounty to the first company or group of individuals to set up a sugar refinery in New Zealand. Up to this time all sugar was imported from Australia.
2. New Zealand Sugar Company formed a partnership Victorian Sugar Company and a number of New Zealand businessmen including such well-known names as Horton, L D Nathan, W S Wilson and Sir Frederick Whitaker. This partnership lasted until the 1888 depression when it was absorbed by the Colonial Refining Company.
3. The original site of 160 acres (later expanded to 450 acres), was purchased because it had a large area of flat land for the refinery, fresh water from Duck Creek, deep water for a port, and building materials on site, all within four miles of Auckland City.
4. Construction started early in 1883, and took 18 months to complete. Clay from excavations was used to make 1.5 million bricks by hand - one million for the refinery and half a million for the dams across Duck Creek. Duck Creek was an ideal site for a sugar refinery. The Waitemata Harbour is at its deepest a few yards from shore. The creek itself could supply the fresh water required for refining sugar, and there was enough land for the refinery buildings.
5. The name "Chelsea" came from the first customs officer at the Refinery, who named it after his home town in London, England (Chelsea).



Match the concept with the paragraph

4	Fresh water is necessary for the refining process.
	Duck Creek was a very good location for the refinery
	The sugar refinery was built of handmade bricks
	The Sugar refinery was re named after an English town.
	Duck Creek was a very good site for the refinery.
	Before 1882 sugar was imported from Australia.
	It was originally called the Colonial Sugar Refining Company.

Answers

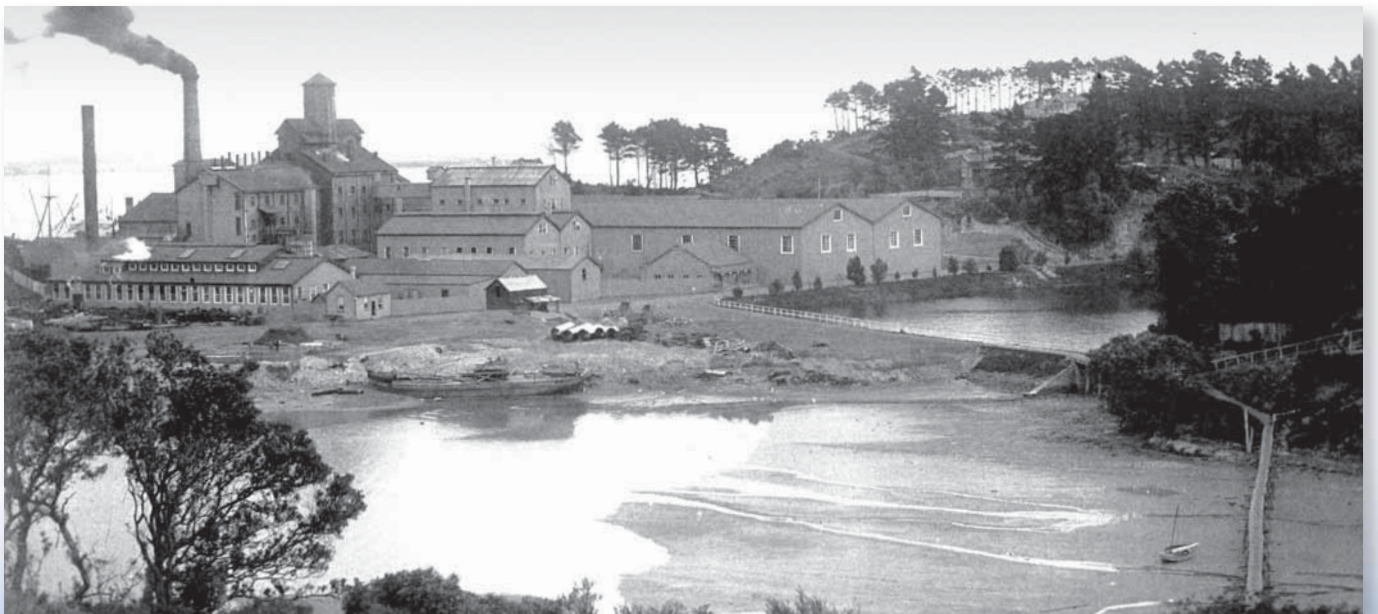
4	Fresh water is necessary for the refining process.
3	Duck Creek was a very good location for the refinery
4	The sugar refinery was built of handmade bricks
5	The Sugar refinery was re named after an English town.
5	Duck Creek was a very good site for the refinery.
1	Before 1882 sugar was imported from Australia.
2	It was originally called the Colonial Sugar Refining Company.

Question Time

Activity: Questioning is an important literacy activity because it shows an understanding of the text read.

Write a question in the box for each of the answers. Questions start with who, what, where, why, when and how.

	<p>Q:</p> <p>A: Duck Creek</p>	<p>Q:</p> <p>A: 18 months</p>	<p>Q:</p> <p>A: Deep water port</p>
<p>Q:</p> <p>A: England</p>	<p>Q:</p> <p>A: 1883</p>	<p>Q:</p> <p>A: Australia</p>	<p>Q:</p> <p>A: From excavations</p>
<p>Q:</p> <p>A: Waitemata Harbour</p>	<p>Q:</p> <p>A: 1882</p>	<p>Q:</p> <p>A: Auckland City</p>	<p>Q:</p> <p>A: 1.5 million</p>



True or False

Activity: Watch the 125 Years of Chelsea clip and decide whether the statements are true or false.

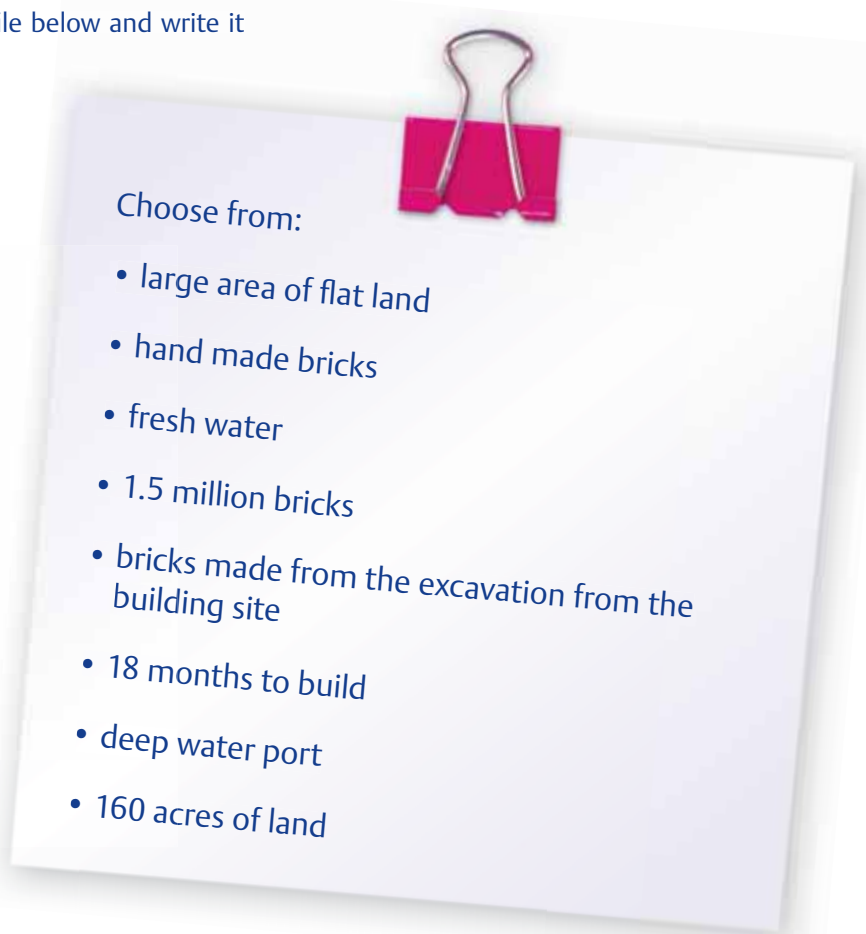
Circle the correct answer:

Sugar has always been in paper bags	True	False
Chelsea Sugar Company had its own Home Guard during WW2	True	False
Chelsea still burns coal at the factory	True	False
Birkenhead was a good site for the factory because there was a port	True	False
Chelsea has been a sugar company for 125 years	True	False
The refinery uses water from the sea	True	False
Golden syrup is an ingredient for ANZAC biscuits	True	False
Chelsea Sugar Company has sold land to be a park	True	False
There were no health and safety rules in the early years	True	False
The whistle woke the workers up at 7:00am	True	False
The refinery was built in 1968	True	False
The sugar was transported by lighters (boats) to Auckland	True	False
A village was built on the hill above the refinery	True	False
The refinery was built of bricks from the clay on site	True	False



Sorting Time

Activity: Sort the information from the file below and write it into the correct category.



Construction

Great Site

Sweet As History: History Road

Activity: As you watch the 125 Years of Chelsea Sugar clip, fill in the important events that occurred throughout its history.

1883

1884

1886

1909

1914

1930

1939

1980

1990's

1996

2002

2009

Level Five

Lesson: Impacts of Chelsea Sugar Refinery on the local community

Focus of lesson / Activity:

Understand how economic decisions impact on people, communities and nations.

Essential Question:

What impact has Chelsea Sugar Refinery had on the local community and beyond?

Concepts: Location

Place, Community, Change, Resources, Interaction, Urbanisation, Heritage.

Level 5: Key Competencies.

Using language symbols and text:

Students to use speech bubbles to understand Chelsea's impact.

Thinking:

Students to think about whether aspects are social or economic.

Participation and Contribution: Students to learn how Chelsea contributes to the local community.

Resources needed:

125 Years of Chelsea clip.
Impact of Chelsea on the Local Community worksheet.
Scissors and Glue.
Crossword.

Lesson Outline:

Students have seen the 125 Years of Chelsea clip.

Students to fill in the gaps in the speech bubbles of people describing the social and economic impacts of Chelsea Sugar Refinery on the local community and develop their own ideas about the impacts of Sugar for all of NZ Society. Students to cut out speech bubbles and sort into 2 columns – social impacts and economic impacts on the local community.

Students could then use the information to write a diary entry or complete an essay writing task.

Cross word activity available for those who finish quickly.

Other notes:

Environmental impact of Chelsea on the local community could be discussed.

Discussion of the impact Chelsea has had on kiwi culture – a NZ icon and known by all – Pavlova and ANZAC biscuits.

Impact of Chelsea Sugar Refinery on the local community

Below are a range of social and economic effects the development of the Chelsea Sugar Refinery has had on the local community in the past.

"The w_____ from the Chelsea Sugar Refinery all shop at my s_____ in Highbury. Without them I would have to close down."

"A new row of shops has opened, bringing our c_____ more goods and s_____. In 1901 there are now six general stores in the area. "

"Without the w_____ that Chelsea built, transport to the c_____ would be more difficult and m_____ wouldn't arrive daily".

"I work at Chelsea with over _____ others... it's a stable job that I know I will stay in for my working life. My f_____ worked there and perhaps my s_____ will too."

"I have a new job as a t_____ at Birkenhead Primary has opened for all the Chelsea workers children."

"I take my children to Chelsea _____, to feed the ducks and play under the t____. It's really pretty there".

"As a local councilor for Birkenhead Borough, its great to see the community grow – now we have a l_____ and more r_____."

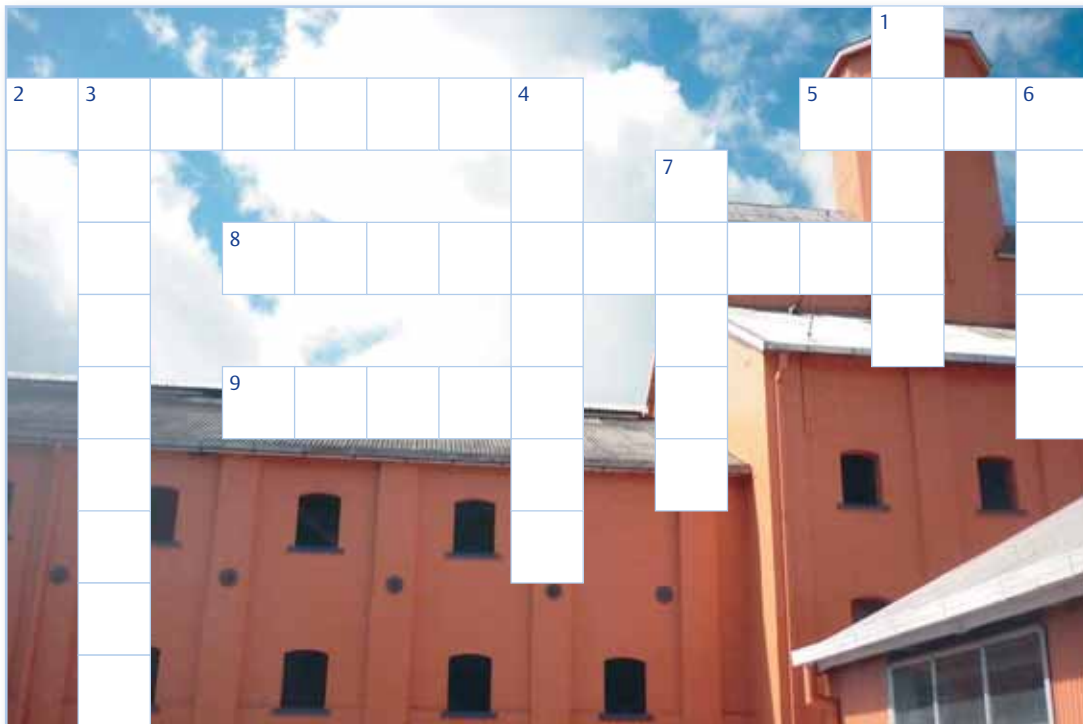
"I was able to buy my family a home with a _____ year loan from the refinery. I built one in Birkenhead, so I was near to work."

"The i_____ I earn from the Chelsea Sugar Refinery supports my f_____. ... in 1958 I earned \$4.20 per week."

When you've finished...

1. Write an essay to describe the social and economic impacts of the Chelsea Sugar Refinery for Birkenhead.
2. Create a new table and list all the social and economic impacts of Sugar for people.
3. Complete the crossword.

Impacts of Chelsea Sugar Refinery Crossword



Across

2. Chelsea has provided _____ growth in this community.
5. There are a range of _____ at the refinery.
8. Chelsea Sugar Refinery is located in this suburb.
9. 25 year home _____ were given to workers to help them buy their first homes.

Down

1. Ash from the factory was used to help build these in Birkenhead.
3. Historically, Chelsea developed a sense of _____.
4. This factory employed hundreds of people in the local community.
6. Chelsea was the only factory in New Zealand that made this vital product.

Level Five

Lesson: Changing Culture, Changing Consumer Needs

Focus of lesson / Activity:

AO: Understand how people seek and have sought economic growth through business enterprise and innovation.

Essential Question:

Why is our changing culture changing sugar?

Concepts:

Culture, Perception, Change, Supply and demand, Innovation, Consumption, Production.

Level 5: Key Competencies.

Using language symbols and text:

Students to use worksheets to collect ideas and develop literacy skills.

Thinking:

Students to think about changing culture and the impacts of the way families produce and consume.

Relating to Others: Students to think in pairs and share ideas with others. Class discussion encouraged.

Resources needed: Part One

Business of Sugar PDF.
Literacy worksheets.

Resources needed: Part One

Low GI handout.
Changing Culture, Changing Sugar worksheets.

Lesson Outline:**Part One:** Getting familiar with Sugar:

- Firstly, introduce Sugar as a business. Students to read the PDF file “Business of Sugar” on the website. Students to complete structured overview and literacy activities based on this information.
- First is sorting basic market information into the different types of markets.
- Discussion starters should be cut and distributed to students to help them start their contribution.
- As a classroom teacher discuss the key economic terms with your students. In the ‘vocab builder’ provided, student to collect and begin to understand the language associated with a business and/or industry.

Part Two: Culture impacting on sugar.

- Students to think about sugar and why we need it. Discuss about sugar and it’s role in issues today such as diabetes and GI. Low GI handout available to read and discuss as a class.
- Students to complete activities on Changing Culture, Changing Sugar worksheet.
- Discuss statements as a class.
- Read handout and debate the similarities and differences in how we use sugar today and in the past (baking and cooking culture).
- Thinking about reasons why people don’t bake or cook in the same way as historically – look at perspectives on food and family meals.
- Students to learn about the new innovations Chelsea have developed in Sugar range to meet new demands from the consumer – discuss as a class Low GI sugar (using handout) and fill in the diagram together as a class. Then get students to complete the other diagrams in pairs or individually.
- Table available for a similar, shorter version of activity.

Other notes:

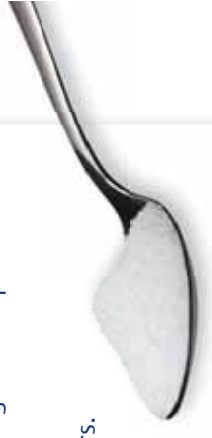
- Great topic to discuss social changes – generation Y and their lack of cooking and baking skills – looking at how companies are trying to encourage young people into the kitchen. Also social change with mothers now more often in the workforce making them ‘time poor’ and wanting products that save time and hassle.
- Looking at Organic industry as an innovative and enterprising new segment in the food industry.

Structured Overview: Extension Task

Using the PDF file “The Business of Sugar” to help you, sort the concepts (write the letter of the statement) from the box below into the correct three file boxes.

The Business of Sugar

- A. Some specialty products such as fine sugar crystals, liquid sugar syrup and sugar blends (sugar and milk powder, salt etc) are exported to parts of Asia and Japan.
- B. World wide sugar production and consumption exceeds 150 million tonnes per annum.
- C. Sugar is a volatile commodity with its price affected by changes in supply and demand.
- D. The New Zealand sugar industry was deregulated in 1986 and is one of only four countries in the world whose sugar industry is wholly deregulated.
- E. There are no tariffs, quotas or controls on the import or export of sugar, ie no industry protection.
- F. Chelsea Sugar exports to the Pacific Islands with key markets including Tahiti, New Caledonia, the Solomons, Fiji and Samoa. Chelsea Sugar also exports some sugar back to Australia.
- G. Sugar blends (sugar and other ingredients) is a developing export business with the key focus on Japan’s beverage and baking sectors.
- H. To be competitive (at home and overseas) Chelsea is committed to competing actively for business, delivering excellent service to its customers, keeping costs under control, providing quality and efficiency in all its operations and developing new products.



Competitive Market

Local Market

Overseas Market

Worksheet: Synonyms

Activity: Read the Business of Sugar handout.

Match the synonym in column two by writing the letter next to the term.

Column One	Correct letter	Column Two
Deregulated		A. To bring into the country
Tariff		B. To sell
Quotas		C. The amount allocated
Commodity		D. Customer
Retail		E. Local market
Domestic		F. Unstable/unpredictable
Import		G. Goods produced
Export		H. Tax/duty
Competition		I. To send overseas
Volatile		J. Rivalry/opposition
Consumer		K. Not controlled

Worksheet: Vocabulary Builder I

Word	I think it means	I know it means
Shanty town		
Engineer		
Producer		
Monopoly		
Tariff		
Importing		
Condemned		
Consumer		
Chemists/pharmacist		
Commodity		
Regulations		
Markets		
Competition		
Brand		
Deregulated		
Volatile		
Export		
Wholesale		
Domestic		
Import		

Worksheet: Sugar Match

Activity: Cut out the products below and match with the correct description.



This sugar has fine crystals and is produced by grading the sugar from the driers and conditioner. It is well dried which keeps its free flowing qualities. This is also ideal for making meringues or pavlova.

This is the most commonly used and is the main sugar we buy from the supermarket. The crystals are a uniform size which makes it ideal for confectionery manufacture and baking.

This is made from sugar syrups that have a high mineral and colour content. This syrup has a rich golden colour and distinctive flavour.

This is natural granulated sugar, with a syrup coating on the crystals giving them a golden brown appearance. This is used in coffee or baking providing subtle changes to colour and flavour of the product.

This is sugar which has been ground to produce a fine powdered sugar. We are all familiar with this product because we use it to make icing at home but it is also ideal for making short bread and cream fillings in biscuits. In the food industry it is used in the manufacture of confectionery such as marshmallows and peppermints.

It has a low GI of 50 compared to white sugar which has a medium GI of 65. This product is good for people who are concerned about sugar levels in their blood and want to maintain consistent energy levels.

Worksheet: Sugar Match

"I think that..."

"I was confused by..."

"I supported..."

"I would like to find out more about..."

"I would argue that..."

"I disagree about..."

"Another idea is..."

"I like...."

"I don't like..."









"One thing that really interested me was..."

"I'm unsure about..."

"Another point to consider is..."



Worksheet: What do you think?

Product	Three things you could use this product for
	1 2 3
	1 2 3
	1 2 3
	1 2 3
	1 2 3
	1 2 3
	1 2 3
	1 2 3

Worksheet: Sugar Match

Activity: Read the “Sugar What where when” (pdf file) on the website and complete the definitions.

Word	I think it means	I know it means
Sucrose		
Carbohydrates		
Obesity		
BMI		
Fructose		
Maltose		
Lactose		
Calorie		



Changing Culture, Changing Consumer Needs

Chelsea Sugar is an iconic brand in New Zealand. An icon is an image, symbol, logo, product, person or building that is recognised and is significant for people within a cultural group. Icons usually have a special status, or are important to, or loved by a group of people.

Historically, the New Zealand Sugar Company Ltd had a monopoly on sugar production.

Sugar has and still is an essential product in many foods we eat. In earlier years all sugar products had the Chelsea Sugar label and it represented sweet treats and home made baking. The culture of cooking was very different 50 years ago. Women were less likely to be found in the paid workforce, especially if she had children. Housewives were expected to cook and bake family dinners and treats. Going out for dinner was a special event, saved for special occasions like birthdays. Women had more time to bake cakes, scones and muffins. Supermarkets didn't exist and packets of biscuits or plastic-wrapped cakes were non-existent.

Today the culture of cooking and the role of women is quite different. Women are working more, have less time to spend in the kitchen and supermarkets sell pre-made, convenience foods to help provide meals for those without the time or skills to cook and bake. Today other variables exist; people are more concerned about their health, as portion sizes have increased, ingredient listing have changed in food and the media promotes thin women as desirable. Chelsea Sugar is aware of consumer trends and needs therefore offers an extensive range.

To adapt to New Zealand's changing culture, Chelsea has developed a range of new products that are time saving and provide to specific consumer needs.



Low Glycemic Index (Low GI)

What is GI?

In advertisements in recent times some foods have been referred to as “Low GI”. But what does that actually mean?

GI is associated with carbohydrates which are the most common source of energy found in food e.g. table sugar, milk, fruit, grains, rice, vegetables, etc. Most carbohydrates break down into glucose (a specific type of sugar) when consumed.

GI is short for The Glycemic Index which is a measure of how carbohydrates in your food affect your blood glucose levels. If the food causes a rush of glucose in your blood followed by a quick fall – the food is higher in the GI scale. If it gives a slower and steadier rise and fall in blood glucose, the GI is lower.

The slower, gentler rise in blood glucose when you eat carbohydrates has been linked to assisting the reduction in heart disease, assists to help reduce the risk of diabetes and assists to help people trying to lose weight. A diet in low GI food is promoted as being a way that people can have a healthier diet.

The table below is a summary of some of the GI measures for common foods we eat (source: Wikipedia).

Low GI Foods	Med GI Foods	High GI Foods
55 or less	56 – 69	70 or more
Most fruits and vegetables (except potatoes and watermelon), grainy breads, pasta, legumes/pulses, milk, yoghurt, products extremely low in carbohydrates (some cheeses, nuts), fructose.	Whole wheat products, basmati rice, sweet potato, table sugar.	Baked potatoes, watermelon, croissants, white bread, many breakfast cereals like Cornflakes and Rice Bubbles, most white rices, glucose.



Can Sugar have a low GI rating?

In a changing world, companies need to change to meet consumer demands. Chelsea Sugar is no different. LoGiCane™ is a new product Chelsea Sugar has launched caters for people concerned about GI levels.

Food Scientists (from Horizon Science in Australia) have developed a process of adding molasses extract onto raw sugar which increases the sugars resistance to digestion. LoGiCane™ takes longer to be digested which means a slower release of energy with a GI rating of just 50.

Worksheet: Changing Culture, Changing Sugar cont.

4. Match the term with the correct definition. For each term give an example to represent it.

Example	Term
	Icon
	Value
	Innovation
	Philosophy
	Culture
	Artificial
	Organic

Definition
A way of looking at the world and can be based on thinking matters such as existence.
Not involving the use of chemicals, only purely natural substances.
An aspect of life recognised by and significant for people within a cultural group.
Something that is important to a person.
Human made or not made by nature.
A way of life, values and beliefs of a group of people.
A new way of doing things or creating something new.

5. Give four reasons why people don't cook and bake as often as they did in the past.



6. As people's opinions and perceptions of food change, food manufacturers product ranges change to meet consumers demand. Look at some of the new Chelsea products and in groups discuss the questions and fill in the diagrams on the following pages for each new innovative product.

What is LoGiCane™ Sugar?

LoGiCane™ Low GI Sugar

Raw Sugar with
lower GI rating.



Who would use this product?

How is this an example of innovation?

Would you use this? Why? Why not?

What is Jam Sugar?

Jam Sugar

Cook jam in 4
minutes.



Who would use this product?

How is this an example of innovation?

Would you use this? Why? Why not?

What is Rich Chocolate Icing Sugar?

Rich Chocolate Icing Sugar

Who would use this product?



How is this an example of innovation?

Would you use this? Why? Why not?

What is Organic Raw Sugar?

Organic Raw Sugar



Who would use this product?



How is this an example of innovation?

Would you use this? Why? Why not?

Worksheet: What do you think?

Product	What is it used for?	Who would use it?	How is this innovative?
<p>LoGiCane™ Low GI Sugar</p> 			
<p>Jam Sugar</p> 			
<p>Rich Chocolate Icing Sugar</p> 			
<p>Organic Raw Sugar</p> 			

Level Five

Lesson: Sweet Resources

Focus of lesson / Activity:

AO: Understand how people manage resources for environmental and social sustainability.

AO: Understand how people seek and have sought economic growth through business enterprise and innovation.

Essential Question:

What resources does the Chelsea Sugar Refinery need to produce sugar?

Concepts:

Resource, Place, Location, Interaction, Sustainability, Production.

Level 5: Key Competencies.

Using language symbols and text:

Students to use worksheets and DVD to collect information about resources used in the Chelsea Sugar Refinery.

Thinking:

Students to think about resources that are used in sugar production and present as a recipe.

Resources needed:

Sweet Resources handout.

Processing of Sugar Part A and B.

And/or Chelsea Sugar Website: "Making Sugar" www.chelsea.co.nz

And/or 125 Years of Chelsea clip.

Lesson Outline:

Students to use "What is a Resource" handout to gain an understanding of resources – needs, wants, natural, cultural, renewable and non-renewable.

Students to read the "Processing Of Sugar" fact sheets or look at the "Making Sugar" section of the Chelsea Sugar website to learn how sugar is made. They would also benefit from watching the 125 years of Chelsea clip.

Using information from the factsheet and video clips, students to brainstorm all the resources Chelsea needs to produce sugar for our supermarkets.

Students to categorise these resources into natural, cultural, renewable and non renewable and fill in worksheet, identifying resources in the aerial photo where possible.

Students then create a 'recipe' for making sugar using information and fill in the recipe worksheet.

Other notes:

Ideas for resources include: Sugar cane, good climate, fertile soils, fertilisers, harvesting machines, farms, boats, trucks, sacks, machines, workers, farmers, fresh water, power (coal and electricity), wharf, port, roads, Harbour Bridge, food scientists, money (capital), managers, technology, accountants, graphic designers, dams, paper, plastic, chemicals e.g. lime, etc.

See Level 3 "Mapping Resources" for more lesson ideas.

Worksheet: What is a Resource?

Resources are things that people use. They can be things we see every day like pens, cars, cell phones or chairs. They can also be things that are not physical objects but we use all the time like language or maths skills. Resources can be needs, things we can't live without like food and water. Resources can be wants, things we don't need to live, but that make our lives better or easier so we want them, like TV and the internet.



Resources can also be natural or cultural. Natural resources are things that are made by nature and not people. They are often things we can't live without like water, air, land and oil. Cultural resources are things made by people and are often things that we want. Cultural resources are often made from natural ones. For example trees make paper and wood and oil is made into plastic.



Finally, resources can be renewable or non-renewable. Renewable is when a resource can be easily replaced. It means it can be re-grown or reoccur. Sunshine is a resource that reoccurs and so does rainfall, bringing water. Trees and animals can be re-grown so they are renewable, wool is renewable and so is sugar. But some resources, once they are used can not be replaced. These are known as non-renewable resources. Oil and other minerals like coal, takes millions of years to form, and cannot be re-grown.



Resources are vital to the way we live. We need them to develop, grow, function. Without them we would live like cave people did thousands of years ago. But, it's important to understand that resources need to be used in a way that protects them from running out so that we can benefit from them in the future.



ACTIVITIES:

1. Using magazines, clip art or your own drawing skills, create a poster to show what resources are. You need to show needs, wants, cultural, natural, renewable and non-renewable resources.
2. Make a definitions page with pictures to show all the key words from the text above.
3. Create a wordfind with key words from the text above – give it to your neighbour to do.
4. Write a jingle or rap about the different types of resources we have.
5. Make a list of all the needs, wants, cultural, natural, renewable and non-renewable resources in your home. Try to think of at least 5 for each type.

Worksheet: What resources are needed to make Sugar?

Activity: After watching video clips of Chelsea sugar refinery and reading how Sugar is processed, identify and categorise all the resources needed for Chelsea to produce sugar and other related products. Where possible, identify these resources in the photo shown.

Natural

Cultural

Renewable

Non Renewable



Worksheet: What resources are needed to make Sugar?

Recipes are a set of ingredients and decisions needed to make food successfully (i.e. deliciously) every time. Recipes are written down with instructions like ingredients, mixing techniques, methods and serving suggestions.

Fill in the recipe sheet below using all the information you have learned about sugar and how it is produced.

Ingredients:

A cup of...

A teaspoon of...

A tablespoon of... e.g. Transport

A dash of...

500 grams of...

A sprinkle of...

300 millilitres of...

A pinch of...

Method:

Add a bowl... e.g. Raw sugar

Sift out...

Blend with...

Heat up...

Whip...

Stir...

Mix with...

Sift with...

Boil for...

Stir again...

Dry out...

Finally...

Serving Suggestions:

Serve hot with....

Serve cold with....

Slice....

Cut up and...

Serve with....

Pour over...

Enjoy with...

Level Five

Lesson: Sustainable Sugar

Focus of lesson / Activity:

AO: Understand how people manage resources for environmental and social sustainability.

AO: Understand how people seek and have sought economic growth through business enterprise and innovation.

Essential Question:

How sustainable is the Chelsea Sugar Refinery?

Concepts:

Sustainability, Social Responsibility, Environment, conservation, Heritage.

Level 5: Key Competencies.

Using language symbols and text:

Using images and captions to match with sustainability case study material. Newspaper article comprehension.

Thinking:

Students to think about social and environmental sustainability and connect these to Chelsea Sugar.

Relating to Others:

Working together to research a topic associated with sustainability and sugar production.

Managing Self: Research task.

Resources needed:

Photo and Caption worksheets.
Role of Chelsea Heritage Park worksheet.
Wordfind and code breaker.

Lesson Outline:

Students to discuss as a class the concepts of Environmental Sustainability and Social Sustainability

Student to match the photos with captions on Sustainable Sugar worksheets and attached to aerial photo star diagram. Discuss elements of social and environmental sustainability for these aspects of Chelsea production (perhaps look at cane sugar too).

Read article and answer comprehension questions.

Students can then complete their own research into an aspect of Chelsea that is related to sustainability and present their findings to the class. Presentation should be selected by students themselves.

Wordfind and code breaker for fast finishers.

Other notes:

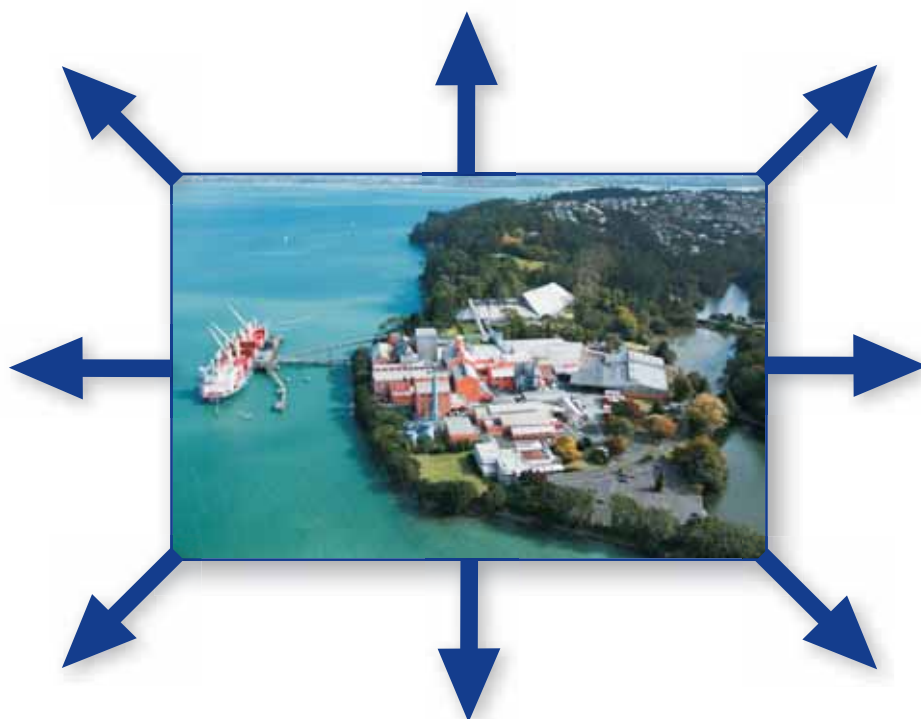
Points of interest or discussion:

Water: consumption of water of the factory is 124 litres per tonne of sugar – which equals 150 buckets of water. Chelsea sends 296 litres of water to treatment plant per tonne of sugar produced.

Energy: 690 kilowatts of energy to produce a tonne of sugar – that's enough to power a light bulb for 8 years.

Is this efficient? Class to discuss.

Worksheet: Chelsea Sugar Refinery and Chelsea Estate Heritage Park



Worksheet: Chelsea Sugar Refinery and Heritage Park cont.



45 ha of native forest protected on site.

Less air pollution as new technologies remove need for coal and animal char.

Creek and dams a protected home to many bird and fish.

Cleaner natural gas replaced coal & oil.

Recyclable packaging like paper is used.

95% of plastic wastes recycled.

Waste products reused such as mud cake used as fertiliser for farms.

Sea water used for cooling and returned back to ocean.

Ponds reduce stormwater pollution entering harbour.

Worksheet: The Role of Chelsea Estate Heritage Park

Chelsea Estate Heritage Park Official Opening Day

Sunday 8th March 2009

The official opening of Chelsea Heritage Park drew large crowds with an estimated 15,000 people turning up to enjoy the old-fashioned gala atmosphere. The event organised by North Shore City Council included attractions for young and old such as vintage car displays, old fashioned Ferris-wheel and merry-go-round, horse and cart rides, a dunk tank (which was a huge hit with the kids) and games such as Chelsea sugar sack races as well as several community exhibits.

The official part of the day kicked off with speeches which included NZ Sugar's General Manager Bernard Duignan. It was widely acknowledged that the sale of the park from NZ Sugar to the Chelsea Heritage Park Trust has ensured its use for future generations as well as preserving the bushland natural habitat for bird life. Mayor Andrew Williams ended the round of speeches by declaring the park officially open to all.

Amongst the range of exhibitors, the Chelsea marquee drew queues of people keen to sample the range of Chelsea syrups on Golden mini pikelets. There were plenty of give-aways on the day with notepads, fridge magnets, sugar stick samples and even packs of sugar given away later in the day.

The sense of community was strong as young and old alike enjoyed the sunny, carnival atmosphere in a park that boasts some of the best views in Auckland.



Read the article about Chelsea's Heritage Park opening.

1. Answer the following comprehension questions:

- What is the Chelsea Heritage Park?
- When was it officially opened?
- Where is Chelsea Heritage Park?
- Who opened the park who was involved in the day?
- Why was this park created?

2. Describe how the park is an example of environmental sustainability. In your answer define or describe the term environmental sustainability.

3. Describe how the park promotes social sustainability in the community also. In your answer define or describe the term social sustainability.

Research Task: Choose one of the following aspects to research further:

Donations of sugar to Tiritiri Matangi

Donations of sugar to Maungatutiri

Water Quality

Air Pollution

Packaging and Recycling

Chelsea Estate Heritage Park

Sponsored Swim and community projects

Worksheet: The Role of Chelsea Heritage Park

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| <input type="checkbox"/> Boats | <input type="checkbox"/> Gas | <input type="checkbox"/> Reduce |
| <input type="checkbox"/> Carbon | <input type="checkbox"/> Heritage | <input type="checkbox"/> Refinery |
| <input type="checkbox"/> Char | <input type="checkbox"/> Kauri | <input type="checkbox"/> Reuse |
| <input type="checkbox"/> Community | <input type="checkbox"/> Kingfisher | <input type="checkbox"/> Shag |
| <input type="checkbox"/> Coot | <input type="checkbox"/> Kokopu | <input type="checkbox"/> Steam |
| <input type="checkbox"/> Dam | <input type="checkbox"/> Lime | <input type="checkbox"/> Sugar |
| <input type="checkbox"/> Donation | <input type="checkbox"/> Maungatautari | <input type="checkbox"/> Sugardust |
| <input type="checkbox"/> Duckcreek | <input type="checkbox"/> Milling | <input type="checkbox"/> Sustainability |
| <input type="checkbox"/> Eel | <input type="checkbox"/> Monitoring | <input type="checkbox"/> Syrup |
| <input type="checkbox"/> Emissions | <input type="checkbox"/> Native | <input type="checkbox"/> Tiritiri |
| <input type="checkbox"/> Energy | <input type="checkbox"/> Paperbags | <input type="checkbox"/> Trucks |
| <input type="checkbox"/> Environment | <input type="checkbox"/> Park | <input type="checkbox"/> Water |
| <input type="checkbox"/> Fauna | <input type="checkbox"/> Plastic | <input type="checkbox"/> Wharf |
| <input type="checkbox"/> Fertiliser | <input type="checkbox"/> Ponds | <input type="checkbox"/> Wildlife |

