

# GINGER BEER



# PROJECT



*Hello!! my name is Phoenix and I look like this.*



*I am holding Phoenix Ginger Beer in my hand because it tastes so good. I am going to take you through this Ginger Beer Project where you can make your very own ginger beer and along the way learn lots of other cool stuff. I will appear throughout this project giving you instructions and tips. First of all here are some facts:*

## **What is Ginger Beer?**

Ginger Beer is a sweet, ginger flavoured carbonated beverage which is traditionally made through methods of brewing and fermentation. Ginger is a spice which produces hot sharp sensation in the mouth, although it is not unpleasant. The basic ingredients in ginger beer are; Ginger, Sugar, Lemon juice, Yeast and Water. Lemon juice adds flavour. It also contains citric acid which lowers the pH of the ginger beer and reduces bacterial growth. Yeasts are more tolerant to low pH than bacteria.

## **Phoenix Ginger Beer:**



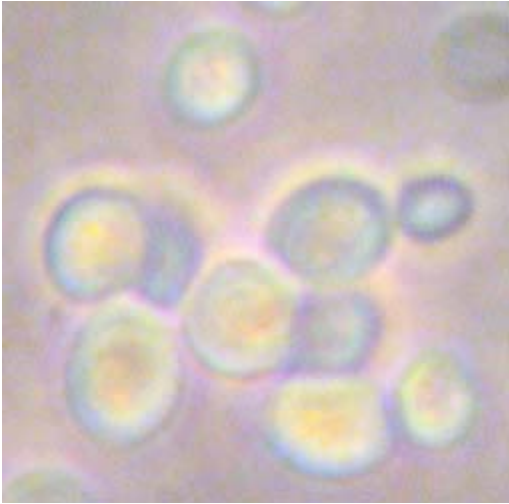
Ginger Beer was the first drink that phoenix began making in 1985. The early ginger beer was called “ginger fizz.” Presently, Phoenix has two kinds of ginger beer one that is sweetened with sugar and the other one with honey. Both of which are organic.

## **What is Organic?**

Organic foods are foods which are grown without using any synthetic fertilisers or pesticides.

A "certified organic" label is usually the only way for consumers to know that a processed product is "organic". Phoenix Organics has chosen BioGro as their certifier. They are New Zealand's leading certification agency with a proven history of high standards and integrity.

## What is Yeast?

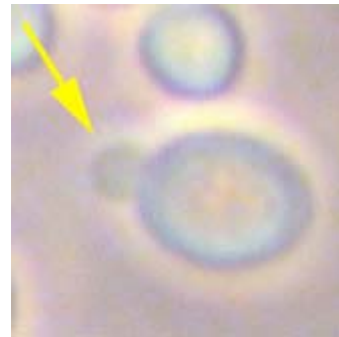


Yeasts are single celled fungi; they are related to other fungi like mushrooms, and the mould in blue cheese. Yeasts are found everywhere in nature, in soil, water, plants and animals. Man has used yeast for thousands of years to make bread rise and for brewing of beer and wine. Yeast are too small to see with the naked eye, it takes 20,000,000,000 (twenty billion) cells to make up one gram of dried yeast. The scientific name for the yeast we are

using is *Saccharomyces cerevisiae* or, “sugar eating fungus”.

(Photo: *Saccharomyces cerevisiae*)

Yeast reproduces by budding, a bud forms from the side of the cell and eventually breaks away forming a new cell. Each yeast cell can bud 12-15 times. In optimum conditions a cell can reproduce every 2-3 hours. Yeast use sugar to get the energy to grow. Sucrose, fructose, glucose and maltose are all types of sugar.

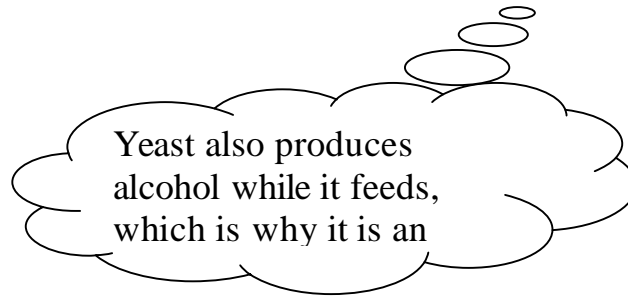


(Photo: *Saccharomyces cerevisiae* budding)

In 1857, Louis Pasteur discovered that yeast is a living organism

## What is Fermentation?

Yeast can live with oxygen (aerobic) or without oxygen (anaerobic). When ginger beer is being brewed in an air tight bottle, the yeast will use up all the oxygen. After this the yeast uses sugar as its food source and becomes active and multiply. Meanwhile, they produce carbon dioxide gas as a metabolic waste product. This process is called fermentation. As the yeast uses more sugar, more carbon dioxide gas is formed and this makes the ginger beer fizzy. At phoenix the ginger beer is pasteurized to 65 degrees Celsius to stop fermentation. The high temperature kills the yeast; otherwise they would keep growing until the bottle explodes! Refrigeration only slows yeast growth so the ginger beer made in class will only last a couple of days.



*Now that you have learned some facts you are ready to move on and make some ginger beer of your own.*



*Listed below are the equipments and the ingredients that you will need to make your own ginger beer.*

## **Equipment List:**

### Per group:

- White Sugar
- Lemon juice/Lemons
- Powdered Ginger
- Hot water (from hot tap is sufficient)
- Standard cup
- Measuring cylinders
- Cheese Cloth
- Weighing balance



### Per person:

- Clean 1.5L plastic soft drink bottle, with lid!
- Jug/Container (approx. 1L)
- Small container/cup
- Funnel



### Provided by Phoenix:

- Yeast
- Labels for bottles



## **INGREDIENTS: For 1.5L of ginger beer**

Powdered ginger:	15g
Sugar:	145g
Lemon juice:	25mL
Yeast:	¼ teaspoon





*Follow these instructions to make your own ginger beer.*

## **INSTRUCTIONS: (FOR 1.5L OF GINGER BEER)**

1) Measure out ginger powder separately for each person.



2) Mix with 300ml of HOT water from the tap, in a jug.



3) Leave to soak for 2-3 hours.

*While you are waiting for the ginger and water to soak, you can start on the labelling ginger beer section.*



4) Measure out sugar. Put into soft drink bottle using dry funnel. Fill the bottle about  $\frac{1}{4}$  full with HOT water. Put the lid on and shake till sugar has dissolved.



5) Add lemon juice to the bottle containing sugar solution.



*In a ginger beer mixture you have sugar and active yeast. The yeast uses the sugar to*

6) After 2-3 hours filter the ginger solution through the cheese cloth placed inside the funnel. The ginger will have settled, pour off the clear part



and throw away the ginger sludge.

7) Rehydrate the yeast by using the method below.

### YEAST REHYDRATION

Phoenix has provided your class with dried yeast. For the yeast to work to their full potential we need to wake them up before putting them into ginger beer.

- Measure required yeast into the small container
- Add about 5ml luke-warm water.
- Leave yeast to rehydrate for 15 minutes.

**IMPORTANT: The yeast must be added within 30 minutes of rehydration**

8) Add the filtered ginger water to the soft drink bottle.

9) Add rehydrated yeast to soft drink bottle

Carbon dioxide gas dissolves into

10) Fill bottle with water, very important, leave a gap at the top, 3-4 cm.

11) Leave to ferment for 24 hours in a warm place, if you can still push the sides of the bottle in, leave for a few more hours, or even

CO2 causes the pressure inside the

till the next day.

12) Put the bottle in the fridge once the sides are hard,  
this stops the  
fermentation. (Yeast doesn't grow in the cold).  
Drink the ginger beer in the next few days. Open  
very slowly as there may be a lot of fizz.

**KEEP REFRIGERATED!!!!!!!!!!!!!!!!!!!!!!**



*WELCOME to the GINGER BEER labelling section. Before you make your own label you need to learn what a label requires to have.*

A label needs to have:

1. **Name or description of the food:** Food must be labelled with an accurate name or description. Labels or descriptions must not mislead consumers; therefore ginger beer must contain ginger. Labels are required to be in English and should stand out from the background.
2. **Address:** Labels must have the name and business address in Australia or New Zealand of the manufacturer or supplier. If a food needs to be recalled for any reason then it makes the job more efficient if there is a business address on the label.
3. **Batch number:** Product also needs to have batch number or date code so that each individual product can be identified.
4. **Best before Date:** Most packaged foods must have a “Best before Date.” It may still be safe to eat the food after the “best before date” but they may have lost some quality and nutritional value. Those foods that should not be consumed after a certain date for health and safety reasons have a “use by” date.
5. **Nutrition Information Panel:** All manufactured food have nutrition information panel so you can compare them. The only exceptions for this are herbs, spices, tea, coffee or unpackaged foods. Nutrition information panel provides information on the levels of energy (kilojoules), protein, total fat, saturated fat, carbohydrate, sugars, and sodium.
6. **Percentage Labelling:** Packaged foods carry labels which show percentage of key ingredients in the food products. The key ingredient for ginger beer is ginger and you can see from the ingredient list in the next page that it has 1.5% ginger.
7. **Ingredients List:** Ingredients is listed from greatest to smallest by ingoing weight. This includes added water too.

8. **Weight and measures:** Food should be labelled with accurate minimum weights information. For example, phoenix ginger beer is labelled as being 330 ml so the minimum volume it is allowed to have is 330ml.



*To make more sense out of what you have just learned, turn to the next page.*

## Food Labels The Requirement:

**6.** Characterising ingredients/ components should be listed

**7.** Ingredients must be listed from greatest to smallest by ingoing weight including added

**1.** Foods must be labelled with an

**2,3.** Labels must have the name and business address in Australia or New Zealand of the manufacturer or supplier for recall purposes. Label must also have batch

**5.** Manufactures are required to provide consumers with basic nutrition information about energy, protein, fat, saturated fat, carbohydrate,

**8.** Food products must be labelled with accurate minimum

**1.** Labels are required to be legible, prominent, in English and

**4.** Food with a shelf life of less than 'two years'

BREWED AND FERMENTED WITH FRESH ROOT GINGER, PHOENIX ORGANIC GINGER BEER HAS THE GENUINE TASTE OF A HANDMADE GINGER BEER. AUTHENTIC TO THE CORE. TRULY IS A BATCH BREWED FERMENTED BEAUTY.

INGREDIENTS: CARBONATE WATER, ORGANIC CANE SUGAR, ORGANIC GINGER (1.5%), ORGANIC LEMON CONCENTRATE, YEAST.

NUTRITION INFORMATION	AVERAGE QUANTITY PER SERVING	AVERAGE QUANTITY PER 100ML
ENERGY	505 kJ	153 kJ
PROTEIN	0.2 g	0.0 g
FAT, TOTAL	0.0 g	0.0 g
- SATURATED	0.0 g	0.0 g
CARBOHYDRATE	29.4 g	8.9 g
- SUGARS	29.3 g	8.8 g
SODIUM	1 mg	0.3 mg

SERVINGS PER PACKAGE: 1  
SERVING SIZE: 330ml

ORGANIC GINGER BEER  
PHOENIX  
NEW ZEALAND  
330ml  
BATCH BREWED & FERMENTED

PHOENIX ORGANICS LTD  
87 HENDERSON VALLEY RD,  
WAITAKERE CITY, NEW ZEALAND.  
FOR INSPIRATION VISIT  
PHOENIXORGANICS.CO.NZ

PHOENIX ORGANIC GINGER BEER IS  
GUARANTEED INDEPENDENTLY CERTIFIED  
TO INTERNATIONAL ORGANIC STANDARDS  
AND IS PRODUCED IN ACCORDANCE WITH  
ENVIRONMENTALLY SUSTAINABLE PRACTICE

5c REFUND AT COLLECTION DEPOTS  
WHEN SOLD IN SOUTH AUSTRALIA  
REFRIGERATE AFTER OPENING

9 413494 000455



*Now that you have learned about labels and their requirement we are going to go bit deeper into nutrition information panel.*

## **NUTRITIONAL INFORMATION for PHOENIX ORGANIC GINGER BEER**

Serving Size: 330 ml		
Servings per package: 1		
Nutrition Information	Average Quantity	Average
Quantity	Per Serving	per 100 ml
Energy	505 kJ	153
kJ		
Protein	0.2 g	0.0 g
Fat - total	0.0 g	0.0 g
- saturated	0.0 g	0.0 g
Carbohydrate	29.4 g	8.9
g		



*You must have seen the Nutrition information panel on packaged food products. So what do these nutrients mean?*

**ENERGY (KJ):** If you look at a food package you can see how many kilojoules (kJ) they contain for a given amount of ml or grams. With this you can get an idea of how much energy you are going to get from the food you are eating. This is especially important for people who are on a diet. Calories or kJ are the measure of the energy the food contains.

For Example: If you weigh 50 kg and you jog for 30 minutes you burn 182 calories.

**PROTEIN:** Protein builds up, maintains and replaces the tissues in your body. Your muscles, your organs and your immune system are made of mostly proteins. Proteins are sometimes described as long necklaces with differently shaped beads. Each bead is a small molecule called an amino acid. These amino acids can join together to make thousands of different proteins. There are many different types of amino acids but 22 amino acids are very important to human health. Of those 22 amino acids, your body can make up 13 of them. The other nine amino acids can get in your body by eating protein rich foods. Some of the protein rich foods are: meat, milk, soybean etc.

**FAT:** Fat is a component of food and is important part of a healthy diet. And little kids, especially need a certain amount of fats in their diets so the brain and nervous system can develop correctly. Fats fuel the body and help absorb some vitamins. They also are the building blocks of hormones and they insulate nervous system tissue in the body. When choosing fat you need to eat the right kind and amount of fat. There are three major types of fats – Unsaturated Fat, Saturated Fat, and Trans Fat.

Unsaturated Fat: These are found in plant foods and fish. These fats are good for the health of our hearts. Examples of food with unsaturated fats in them are olive oil, canola oil, and salmon.

Saturated Fat: These fats are found in meat and animal products such as milk, cheese, butter etc. Eating too much saturated fat can raise blood cholesterol levels and increase the risk of heart disease.

Trans Fat: These fats are found in margarine, some snack goods, baked goods and fried foods. When you see "hydrogenated" or "partially hydrogenated" oils on an ingredient list, the food contains Trans fats. Like saturated fats, eating too much can raise cholesterol and increase the risk of

heart disease.

**CARBOHYDRATE:** Carbohydrates are required by our body. Your body breaks down carbohydrates into simple sugars which is the major source of energy for the body. There are two major types of carbohydrates in food – Simple carbohydrate and Complex Carbohydrate.

Simple Carbohydrate: These are also called simple sugars. Simple Sugars are found in white sugar. They are also found in fruits and milk.

Complex Carbohydrate: These are also called starches. Starches include grain products such as rice, pasta and bread. Refined grains, such as white flour and white rice, have been processed so nutrients and fibre gets removed in the process. But unrefined grains still contain these vitamins and minerals. Unrefined grains also are rich in fibre, which helps your digestive system work well.

**SODIUM:** Table salt is called sodium chloride. It is 40% sodium by weight. Salt is necessary for survival of all living creatures including humans. Salt is involved in regulating the water content. Salt is required for life but over consumption can increase the risk of health problems like high blood pressure. Healthy adults should eat no more than 2,300 milligrams of sodium a day. This is about 1 teaspoon of sodium chloride (salt).

## Nutritional Information Panel



*Now that you have learned all about Nutritional Information Panel, you can calculate the nutrition in your ginger beer by filling in the missing value*

Ingredients	Measure (g)	Energy (kJ)	Protein (g)	Total Fat (g)	Saturated Fat (g)	Carbohydrate (g)	Sugars (g)	Sodium (mg)
White Sugar	145	2393	0	0	0	145	145	7
Lemon juice	25	21	0.1	0	0	0.4	<input style="width: 40px; height: 20px;" type="text"/>	0.5
Powdered Ginger	1.5	<input style="width: 40px; height: 20px;" type="text"/>	1.4	0.9	0.3	<input style="width: 40px; height: 20px;" type="text"/>	0	4.8
Dried Yeast	0.7	5	0.3	0	0	0	0	0.4
<b>Total:</b>		<b>2637</b>	<input style="width: 40px; height: 20px;" type="text"/>	<input style="width: 40px; height: 20px;" type="text"/>	<b>0.3</b>	<b>146.5</b>	<b>145.5</b>	<input style="width: 40px; height: 20px;" type="text"/>

**Make your own Nutrition Information Panel using the following table:**  
 (Assuming that the sugar used by the yeast and converted to carbon dioxide is 5%. The sugar (g) in 1.5L of ginger beer is 139g. Also assume that only 10% of ginger was actually used)

Nutrition Information	Average Quantity per serving (200ml)	Average Quantity per 100ml
<b>Energy</b>		
<b>Protein</b>		
<b>Fat, Total</b>		
<b>-Saturated</b>		
<b>Carbohydrate</b>		
<b>-Sugars</b>		
<b>Sodium</b>		

Serving size: 200ml

*Hint: Remember that the ginger beer you made is 1.5L (1500ml).*



*Now that you have finished making the nutritional information panel for your ginger beer you are ready to design labels for your own ginger beer.*

(You can use this page to practice designing your labels)

**Checklist  
for your  
label:**

Name of  
the product  
0

Address 0

Nutritional  
Information  
Panel 0

Ingredients  
0

Weight of  
the product  
0

Barcode 0

**Product  
needs to  
have:**

*To find out more about how barcodes work turn to the next page.*

## What is a UPC barcode?

When you look at most packaged items purchased from a grocery store it will have a barcode on it.

Have you ever wondered where these codes come from and how do they work?

UPC stands for Universal Product Code. UPC barcodes were originally created to help grocery stores speed up the checkout process. The system became so successful that it quickly spread to all other retail stores.

You can see that the UPC barcode has two parts:

- The machine readable barcode
- The human readable 12 digit UPC number

The first 6 digits (excluding the number before the barcode) of the UPC barcode is the manufacturers' identification number. The next five digits are the item number. Each item has a unique item number.

As you can see, there is no price information encoded in a bar code. When the scanner scans a product, the cash register sends the UPC number to the store's central computer to look up the UPC number. The computer then finds the record associated with that barcode. The central computer sends back the actual price of the item at that moment.



*Your ginger beer must be ready for tasting by now. But before you taste it you should know a bit about sensory evaluation first.*

## What is Sensory Evaluation?

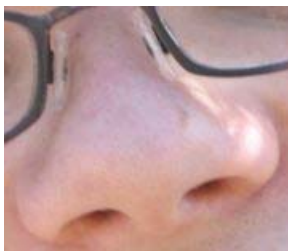
Sensory means of the senses. We have five sensory organs in our body – eyes, ears, nose, tongue and skin. We use these sensory organs to describe and evaluate food products.

**Eyes-** By using our eyes we can look at the colour of the food and determine its quality. For example we know that red tomatoes are riper than green ones. Also it helps us know what the colour of the particular product is supposed to be. For example if we have an orange juice we expect the colour to be orange.



**Ears** – When you open a bottle of carbonated product e.g. Ginger Beer you can hear a hiss sound. From this you can tell the product is carbonated and is not flat.

**Tongue** – Tongue helps us to taste food products. We can tell if the food is salty, sugary, bitter or sour by the help of our tongue. We can determine off flavours in food by the help of our tongue.



**Nose** – Smell is very important in food acceptability. Sometimes we can get put off food if we do not like the smell.

**Skin** – Skin helps us to feel temperatures so we can find out if the food is hot or cold.





*Now that you have learned about sensory organs and how they help us to describe and evaluate food products, you are ready to taste your ginger beer. Follow the instructions below*

## The Ginger Beer Tasting Competition

### Instructions:

1. Refrigerate the ginger beer before tasting it.
2. Get yourself in groups of 4.
3. Taste each others ginger beer within the group. Open the lid slowly as there should be lots of fizz.
4. Fill out “Ginger Beer Evaluation Sheet’ for each person’s ginger beer you tasted including yours. (BE HONEST)
5. Add up the total score you received from each member of your group and give yourself an overall mark out of 100.
6. Compare your overall mark with others from your class to see who made the best ginger beer in class.

Overall mark:    /100



*Next time when you go to the supermarket or café why don't you try a Phoenix Ginger beer.*



# Ginger Beer Sensory Evaluation

## Sheet:

**Circle the number which you think best describes the ginger beer.**

### **Sweetness:**

1    2    3    4    5    4    3    2    1  
*Not sweet enough*                      *just right*                      *Too sweet*

---

### **Heat (Spicy heat, not temperature heat):**

1    2    3    4    5    4    3    2    1  
*Not hot enough*                      *just right*                      *Too hot*

---

### **Ginger:**

1    2    3    4    5    4    3    2    1  
*Not enough ginger*                      *just right*                      *Too much ginger*

---

### **Bubbles:**

1    2    3    4    5    4    3    2    1  
*Not enough bubbles*                      *just right*                      *Too*  
*much bubbles*

---

### **OVERALL:**

1                      2                      3                      4                      5  
*Yuck*                      *OK*                      *Yummy*

---

Mark out of: /25

# ACTIVITIES:



For culture of  
*Saccharomyces cerevisiae*:  
Rehydrate 0.5g yeast. Then  
put it on a slide.

## FINDING YEAST:

### Equipment required:

Microscope  
culture of *Saccharomyces*

Look under the microscope to identify the Yeast, *Saccharomyces cerevisiae*  
(ask your teacher to help you with this).

Draw what you saw in the space below.

## MAKE A PHOENIX YEAST-AIR B

### Ingredients & Equipment

Sugar: 2 tablespoons

Yeast: 1 tablespoon

1 cup Warm Water- 40°C-  
45°C

1 Small bottle: 1L

1. Stretch out the Phoenix balloon by blowing it out.
2. Combine sugar, yeast and warm water into a small bottle and stir.
3. Attach the balloon to the mouth of the bottle.
4. After several minutes, you will notice the balloon standing upright. If you don't see anything happen, keep waiting, eventually the balloon will inflate.

Draw and explain what you saw happening in a sequence:



*What's going on?*

*As the yeast feeds up on sugar, it produces carbon dioxide. Since there is no other place to go the gas fills up the balloon.*

# **FOOD & DRINK MADE WITH YEASTS**

**HOW MANY FOODS AND DRINKS CAN YOU LIST WHICH IS MADE WITH YEASTS.**

1. Bread varieties.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11.

12.

13.

14.

15.

**If you can name**

4- 6 foods = GOOD

7- 9 foods = EXCELLENT

10+ foods = GENIUS



Compare your results with others in your class. Who named the most food and drink made with yeast?

# **GINGER BEER WORD FIND:**

**FILL IN THE BLANKS AND FIND THE ANSWERS IN THE GRID IN THE NEXT PAGE. (THE UNUSED LETTERS READ OUT A HIDDEN MESSAGE)**

1. Conversion of sugar into carbon dioxide using yeast =  
.....
2. Builds up, maintains and repairs the tissue of your body =  
.....
3. Calories are the measure of the ..... the food contains.
4. Complex ..... is also called starch.
5. Salt is also known as ..... chloride.
6. .... is single celled fungi, a few species of which are used to leaven bread and brew beer.
7. Carbon dioxide makes the ginger beer .....
8. Eyes, Ears, Skin, Nose and Tongue are the 5 ..... organs.
9. Yeasts reproduce by .....
10. Without oxygen = .....
11. Saturated, Unsaturated and Trans are three types of .....

P	S	H	Y	O	E	C	N	F
A	E	I	G	X	O	A	P	E
N	N	R	R	G	A	R	N	R
A	S	I	E	C	O	B	S	M
E	O	S	N	T	G	O	I	E
R	R	N	E	G	D	H	G	N
O	Y	I	E	I	R	Y	N	T
B	N	E	U	B	E	D	I	A
I	E	M	A	R	I	R	D	T
C	S	Y	U	S	M	A	D	I
M	S	T	A	F	T	T	U	O
F	I	Z	Z	Y	Y	E	B	N



**THE HIDDEN MESSAGE YOU DISCOVERED IS:**

\_\_\_\_\_

\_\_\_\_\_

# **FURTHER INFORMATION:**

For more information on the following topics go to:

## ❖ **Phoenix Ginger Beer**

- [www.phoenixorganics.co.nz](http://www.phoenixorganics.co.nz)

## ❖ **Ginger Beer**

- <http://collections.ic.gc.ca/science/english/bio/projects/microbio.html>
- [http://www.sycd.co.uk/aka\\_science/pdf/explore/biotechnology/FizzyTG.pdf](http://www.sycd.co.uk/aka_science/pdf/explore/biotechnology/FizzyTG.pdf)
- [http://biology.clc.uc.edu/fankhauser/Cheese/Ginger\\_Ale\\_Ag0.htm](http://biology.clc.uc.edu/fankhauser/Cheese/Ginger_Ale_Ag0.htm)

## ❖ **Fermentation**

- <http://www.brewerylane.com>

## ❖ **Yeast**

- [www.dakotayeast.com](http://www.dakotayeast.com)
- <http://www.breadworldcanada.com/sciencehistory/science.asp>
- <http://www-micro.msb.le.ac.uk/video/Scerevisiae.html>
- <http://exploratorium.edu/cooking/bread/activity-yeast.html>

## ❖ **Food Label Requirements**

- <http://www.foodstandards.gov.au>

## ❖ **Food Nutrients**

- <http://www.kidshealth.org>
- <http://tiki.oneworld.net/food/calories.html>
- <http://www.americanheart.org/presenter.jhtml?identifier=4708>
- <http://en.wikipedia.org>

## ❖ **Sensory Evaluation**

- <http://www.qmuc.ac.uk/fif/Sensory.htm>
- <http://www.sweetmarias.com/article.sensory-evaluation.html>
- <http://www.afbini.gov.uk/index/about-us/facilities/sensory-evaluation-unit.htm>

## FEEDBACK:

Now that you have finished the Ginger Beer Project why don't you log on to the Phoenix Organics' website: [www.phoenixorganics.co.nz](http://www.phoenixorganics.co.nz) and fill out the Ginger Beer Feedback section. Here, you can write about how you found the Ginger Beer Project. This will help us to make the Ginger Beer Project better in the future.

# GINGER BEER CHAMPION

This is to certify that  
..... has completed the  
Ginger Beer project and scored ...../100 on his/her ginger beer.



**GIVE YOURSELF A PAT IN THE BACK!!!!!!**



CERTIFIED BY:

.....

## TEACHERS SECTION:

This section contains information for teachers on “The Ginger Beer Project”

This “Ginger Beer Project” can be done over a week as a whole assignment or can be broken down into several weeks and done section by section. If you have limited time then only the making of ginger beer experiment can be done. How you go about implementing this project into your curriculum is up to you.

While the students wait for the ginger to be soaked they can work on the labelling of the ginger beer section.

If your aim is to complete making the ginger beer in one period then ginger should be soaked 2 hours before class starts.

Answers to the questions asked in this project are attached in the pages to follow.

At the end of the teacher’s section there is a teacher’s feedback form attached. By filling this form out you will help to make this project better in the future.

# ANSWERS:

## Nutritional Information Panel

Ingredients	Measure (g)	Energy (kJ)	Protein (g)	Total Fat (g)	Saturated Fat (g)	Carbohydrate (g)	Sugars (g)	Sodium (mg)
White Sugar	145	2393	0	0	0	145	145	7
Lemon juice	25	21	0.1	0	0	0.4	0.5	0.5
Powdered Ginger	1.5	218	1.4	0.9	0.3	1.1	0	4.8
Dried Yeast	0.7	5	0.3	0	0	0	0	0.4
<b>Total:</b>		<b>2637</b>	<b>1.8</b>	<b>0.9</b>	<b>0.3</b>	<b>146.5</b>	<b>145.5</b>	<b>12.7</b>

**Make your own Nutrition Information Panel using the following table:**  
 (Assuming that the sugar used by the yeast and converted to carbon dioxide is 5%. The sugar (g) in 1.5L of ginger beer is 139g)

Nutrition Information	Average Quantity per serving (200ml)	Average Quantity per 100ml
<b>Energy</b>	352	176
<b>Protein</b>	0.2	0.1
<b>Fat, Total</b>	0.1	0.05
<b>-Saturated</b>	0.0	0.0
<b>Carbohydrate</b>	19.5	9.8
<b>-Sugars</b>	19.4	9.7
<b>Sodium</b>	1.7	0.9

Serving size: 200ml

# **GINGER BEER WORD FIND:**

**FILL IN THE BLANKS AND FIND THE ANSWERS IN THE GRID IN THE NEXT PAGE. (THE UNUSED LETTERS READ OUT A HIDDEN MESSAGE)**

1. Conversion of sugar into carbon dioxide using yeast = FERMENTATION
2. Builds up, maintains and repairs the tissue of your body = PROTEIN
3. Calories are the measure of the ENERGY the food contains.
4. Complex CARBOHYDRATE is also called starch.
5. Salt is also known as SODIUM chloride.
6. YEAST is single celled fungi, a few species of which are used to leaven bread and brew beer.
7. Carbon dioxide makes the ginger beer FIZZY
8. Eyes, Ears, Skin, Nose and Tongue are the 5 SENSORY organs.
9. Yeasts reproduce by BUDDING
10. Without oxygen = ANAEROBIC
11. Saturated, unsaturated and Trans are three types of FATS

P	S	H	Y	O	E	C	N	F
A	E	I	G	X	O	A	P	E
N	N	R	R	G	A	R	N	R
A	S	I	E	C	O	B	S	M
E	O	S	N	T	G	O	I	E
R	R	N	E	G	D	H	G	N
O	Y	I	E	I	R	Y	N	T
B	N	E	U	B	E	D	I	A
I	E	M	A	R	I	R	D	T
C	S	Y	U	S	M	A	D	I
M	S	T	A	F	T	T	U	O
F	I	Z	Z	Y	Y	E	B	N

**THE HIDDEN MESSAGE YOU DISCOVERED IS: PHOENIX  
ORGANICS GINGER BEER IS YUMMY**

**Teacher's Feedback:**

1) Was the recipe simple enough for students to follow without difficulty?

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2) Was there enough relevant information provided with the kit?

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3) Does the ginger beer project fit in with the science curriculum?

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4) Did your students enjoy making ginger beer?

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5) Was the ginger beer a success?

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6) How could this kit be improved?

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