

“ Design and Make a Delicious Loaf of Bread”

INTRODUCTION

This project has been developed from the QCA Unit of Work 5b Bread and provides an opportunity to develop student understanding of, and skills in, working with food through a range of activities related to bread products.

Students will develop their knowledge and understanding of bread making through a variety of planned activities. These activities are designed to both increase and develop subject specific vocabulary and encourage an understanding of the Design Process used within the curriculum area of Design Technology.

Activities include investigating existing products and exploring the functions and properties of ingredients. Students should then draw on this knowledge when designing and making their own bread products. Students will develop and use a range of skills and techniques using basic food tools and equipment while being encouraged to take account of appropriate safety and hygiene issues.

It is recommended that <http://www.carrsbreadmaker.info/education/index.html> is used for research and additional resources, specifically the link to online baking games. The “Grain Chain” is particularly helpful to increase understanding of wheat processing.

Due to the time involved in actually making the bread it is recommended that the students work in small groups.

HEALTH AND SAFETY

When carrying out a risk assessment for this activity, teachers will need to consider the materials, tools and equipment being used.

In addition, the following points should be noted:

Parental permission should be sought before tasting sessions in order to identify any dietary and cultural requirements for consideration

e.g. nut allergy; coeliac disease; lactose intolerance.

Hygiene practices should be observed

e.g. surfaces cleaned down and wiped with antibacterial cleaner; a plastic table cover kept for food activities and used to cover tables; aprons provided for food preparation; access to hand-washing and washing-up facilities and appropriate storage facilities for food.

Students should learn safe practices in relation to equipment.

E.g. use of electrical equipment, use of protective gloves.

PRIOR LEARNING

This project has been written on the assumption that the students have very little prior knowledge of the skills used in Food Technology. However, it may be helpful if the students have:

- A basic understanding of the importance of hygiene in relation to the preparation of food.
- An awareness of the need for responsible action when using equipment.
- An awareness of the need for accuracy when using weighing and measuring equipment.

VOCABULARY

During this project students will use words and phrases relating to:

• Designing

E.g. evaluate, investigation, preferences, product profile, specification, criteria, fair test, costing.

– Sensory Characteristics

E.g. aroma, texture, flavour, appearance, doughy, crisp, chewy, yeasty, stretchy, elastic, risen.

• Making

E.g. ingredients, quantities, shaping, mixing, kneading, proving, baking, cooking method, glazing.

– Tools and Equipment

E.g. weighing scales, breadmaking machine, measuring jug, teaspoon, dessert spoon, tablespoon, oven gloves.

• Knowledge and understanding

E.g. yeast, wheat, grain, flour, dough, crust, rise.

– Food Safety

E.g. hygiene, bacteria, mould, decay, food poisoning, allergy.

ASSESSMENT

The following descriptors are included to aid in the assessment of the work undertaken and produced during this project.

Level 3

Students will:

- Demonstrate some understanding of the Design Brief through identifying something they need to find out to be able to undertake the work; identify someone or something that can help them; make a suggestion as to what their bread needs to be like to be “delicious”.
- Generate a few simple ideas for a bread product
- Give a simple reason for their choice of ingredients.
- Make a bread product with support and guidance from staff.
- Demonstrate some degree of accuracy when making the product.
- Work in a safe manner demonstrating some understanding of basic hygiene concerning the preparation of food.
- Demonstrate a degree of accuracy in completing the product profile, using some descriptors that are relevant to the product.

- Identify something they have done well during this work and something they could do better if they were to repeat the project.

Level 4

Students will:

- Demonstrate some understanding of the Design Brief through identifying a number of things they need to find out to be able to undertake the work.
- Identify a variety of sources that can help them complete the work.
- Make a number of suggestions as to what their bread needs to be like to be “delicious”.
- Generate a number of ideas for a bread product suggesting specific ingredients to influence the flavour, texture and appearance of the bread.
- Give reasons for their choice of ingredients.
- Produce a simple specification for their bread.
- Produce step by step instructions as to how to make their bread, including basic hygiene procedures.
- Safely, and predominately independently, make a bread product.
- Demonstrate a good degree of accuracy when making the product.
- Work in a safe manner demonstrating an understanding of hygiene and safety concerning the preparation of food.
- Demonstrate a good degree of accuracy in completing the product profile, identifying descriptors that are relevant to the product.
- Identify what they have done well during this work and something they could do better if they were to repeat the project.
- Evaluate their bread product against their specification and using both their specification and product profile make a suggestion as to how to improve their bread.

Level 5

Students will:

- Demonstrate a clear understanding of the Design Brief through identifying and giving reasons for a number of things they need to find out to be able to undertake the work.
- Identify a variety of sources that can help them complete the work and explain how they will use these sources and what they hope to find out.
- Make a number of suggestions as to what their bread needs to be like to be “delicious”.
- Generate a range of ideas for a bread product suggesting specific ingredients to influence the flavour, texture and appearance of the bread.
- Give reasons for their choice of ingredients including identifying the functions of the various ingredients in bread making.
- Produce an initial specification for their bread including sensory qualities and consideration for size, shape and cost.
- Produce step by step instructions as to how to make their bread, including hygiene procedures, recording and justifying the need for changes as they occur.

- Safely and independently make a bread product.
- Demonstrate a high level of accuracy when making the product.
- Work in a safe manner demonstrating an understanding of hygiene and safety concerning the preparation of food.
- Demonstrate a high level of accuracy in completing the product profile, identifying descriptors that are relevant to the product.
- Identify what they have done well during this work and how they could do better if they were to repeat the project.
- Evaluate their bread product against their specification and using both their specification and product profile to suggest how to improve their bread.

TEACHERS PAGE

Activity One - Introduction to the Design Brief

Aims:

The aim of this first activity is to introduce the Design Brief and guide the students through an analysis of the brief using the analysis sheet. From this activity it is possible for the students to plan some individual research as well as gaining part ownership over a variety of possible class learning activities. For example: the use of the “Grain Chain” activity available on the Carrs Breadmaker web site, to develop an understanding of the stages in the processing of the wheat.

Objectives:

By the end of the activity students will:

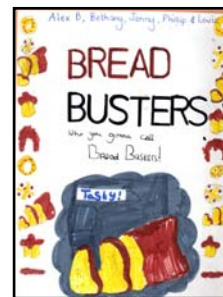
- Identify what has to be done to complete the Design Brief
- Produce a plan that includes personal research

Resources:

- *Design Brief* sheet
- *Brief Analysis* worksheet
- *Planning* worksheet

Activity:

A whole class discussion is one way to start this activity, discussing the types of bread they like and where they get their bread from. From this the Design Brief can be introduced along with the expectations of the work to be included in a group design folder. *(N.B. The format of the folder is optional; we used sugar paper folded into A4 size booklets and gave 1 booklet to each group. All the following work was then presented in these booklets and decorated by the individual groups.)*



Working in small groups the students can use the analysis sheet to stimulate discussion as to what kind of bread they need to make.

Questions to stimulate the discussion could include:

What could we do?

What do we need to know?

Who could we ask?

What could we use?

What has the bread got to be like?

Leading on from the analysis of the Brief, students could look at the planning sheet. This sheet encourages students to think of the work they would like to complete to find out about different bread and to be able to make their bread. Some activities may be class based such as finding out how to use a bread making machine, or finding out what ingredients are in bread. Whilst other tasks could be individual research tasks such as making a collage, researching breads from around the world, interviewing a local chef or using the “Grain Chain” activity linked on this web site.

Design Brief

“Design and Make a Delicious Loaf of Bread”

Your Design Folder should contain:

- Details of what must be done to complete the brief
- Evidence of work undertaken, sampling, recording evaluating
- Evidence of idea generation
- An Initial Specification for your bread
- Information about the chosen ingredients, what they are, where they come from, reasons for use
- Detailed recipe
- Step by step instructions to make the loaf
- Evaluation using a product profile to illustrate the sensory characteristics of the loaf

“Design and Make a Delicious Loaf of Bread”

Brief Analysis

What do we need to know?

Who can help us?

What do we want our bread to be like?

Group Names: _____

Planning

Use this sheet to work out what you need to do, in what order, and who will do the work. I have given you one example to help you.

Work to be done	Who is responsible	When the work must be done by
<i>Collect a range of pictures of different bread products and make a collage to help us get ideas for flavours.</i>	<i>A. Name</i>	<i>01/01/01</i>

Group Names: _____

TEACHERS PAGE

Activity Two – Bread Making

Aims:

The aim of this activity is to introduce the students to the process of making bread using a breadmaking machine and the associated health and safety considerations when making food products.

Objectives:

By the end of the activity students will:

- See the sequence of activities necessary to produce a loaf of bread using a breadmaking machine.
- Begin to recognise that ingredients have different characteristics.
- Understand how to work safely and hygienically.



Resources:

- Breadmaking machine
- *Basic bread recipe* sheet
- Strong flour
- Yeast
- Salt
- Sugar
- Fat
- Weighing scales and measuring spoons
- Apron
- Oven gloves
- Cooling rack
- Bread board and bread knife
- *What do the ingredients do?* worksheet

Activity:

The purpose of this activity is to demonstrate to the students how to produce a loaf of bread using a breadmaking machine. Please note that it is really important that the manufacturer's instructions are followed when putting the ingredients into the machine, and the recipe that you are using is suitable for the breadmaking machine you have. See resource "Recipes for Breadmaking Machines".

This activity also provides the opportunity to explain the function of the various ingredients and as an aid to this there is an explanation of the functions below. It is worth remembering that salt affects the yeast and care must be taken when introducing the different ingredients to the machine. We put all

the small quantity ingredients into different corners of the breadmaking machine pan and found that the students easily remembered this part of the activity.

N.B. We reduced the quantity of salt in our recipe due to a consensus of opinion that the bread was too salty using the quantity recommended. I would therefore recommend that the salt measurement be treated with caution.

By demonstrating the bread making you can also cover the hygiene and safety procedures;

- Wearing an apron
- Tying long hair back
- Ensuring the area and equipment are clean
- Washing hands prior to touching the ingredients or equipment

What *do the ingredients do?* worksheet provides the opportunity to consolidate learning concerning the functions of ingredients and basic hygiene.

Recipes for Breadmaking Machines:

<http://www.carrsbreadmaker.info/recipes/index.html>

Ingredients:

These recipes have been created for 500g loaves to produce the best tasting loaf in each by manufacturer. N.B. Always follow your machine manufacturer's instructions for the order in which to add the ingredients.

Wholemeal Flour

	Flour (g)	Water (ml)	Yeast (tsp)	Salt (tsp)	Sugar (tsp)	Fat (tbsp)
Hinari HB174	500	325	1	1½	2	1
Morphy Richards 482220	500	300	¼	1½	2	1
Prima ABM2	500	350	½	1½	2	1
Electrolux BR300	500	325	1	1½	2	1
Moulinex ABKE P1	500	280	1	1½	2	1
Kenwood BM200	500	330	¼	1½	2	1
Breville BR6	500	350	½	1½	2	1
Russell Hobbs Pro / Ultimate	500	350	2	1½	2	1
Panasonic SD253 / SD255	500	350	½	1½	2	1

Strong White Flour

	Flour (g)	Water (ml)	Yeast (tsp)	Salt (tsp)	Sugar (tsp)	Fat (tbsp)
Hinari HB174	500	305	1	1½	2	1
Morphy Richards 482220	500	305	1	1½	2	1
Prima ABM2	500	305	½	1½	2	1
Electrolux BR300	500	305	½	1½	2	1
Moulinex ABKE P1	500	250	1	1½	2	1
Kenwood BM200	500	305	¼	1½	2	1
Breville BR6	500	305	½	1½	2	1
Russell Hobbs Pro / Ultimate	500	290	2	1½	2	1
Panasonic SD253 / SD255	500	320	½	1½	2	1

Strong Brown Flour

	Flour (g)	Water (ml)	Yeast (tsp)	Salt (tsp)	Sugar (tsp)	Fat (tbsp)
Hinari HB174	500	325	1	1½	2	1
Morphy Richards 482220	500	300	¼	1½	2	1
Prima ABM2	500	325	1	1½	2	1
Electrolux BR300	500	325	1	1½	2	1
Moulinex ABKE P1	500	280	1	1½	2	1
Kenwood BM200	500	320	¼	1½	2	1
Breville BR6	500	325	½	1½	2	1
Russell Hobbs Pro / Ultimate	500	325	2	1½	2	1
Panasonic SD253 / SD255	500	325	½	1½	2	1

Function of Ingredients and helpful hints:

<http://www.carrsbreadmaker.info>

You don't have to be a scientist to bake bread but it helps to appreciate that it's just basic chemistry that turns flour, yeast and the other ingredients into bread.

The ingredients work off one another in a precise way and slight mis-measurements, or indeed putting the wrong ingredients in, can make a real difference to the quality of the bread.

A short explanation of how some of the main ingredients work may be helpful:

Strong Flour:

Strong flour is important for bread making because it is high in the protein Gluten which enables the bread dough to stretch, hold the gas produced by the yeast and form the structure of the bread.

Yeast:

Yeast is a living organism. Mixed with water and sugar the yeast wakes up during the kneading process and gives off carbon dioxide bubbles, filling your bread with tiny holes that make it rise. If flour is the foundation of bread, yeast is the primary building block. Some yeasts enhance the flavour of your flour, while others impart a distinctive flavour of their own.

Salt:

Salt inhibits the yeast but is needed for flavour - a balance to keep in mind if you experiment with sugary fruit recipes, or salty savoury breads. Salt is used to enhance the flavour of the product.

Sugar:

Sugar is the essential food for yeast, but too much of it will affect the yeast. Use sparingly if you are adding fruity ingredients otherwise the taste will be too sweet.

Fat:

Fat is used to improve the crumb texture of the loaf, or enrich the dough. Some people use butter or margarine, other like to try flavoured oils.

Measuring:

Bread making machines do require one thing: precision. Careful measurement can make the difference between a lovely loaf and something really disappointing.

For dry ingredients use accurate equipment such as scales or measuring cup/spoon and make certain the top is level. For key ingredients like sugar, salt and yeast use small exact quantities.

Water temperature:

Use tepid water in your machine. Cold water won't activate the yeast, and hot water will speed it too much, and very hot water will kill it.

Getting the ingredients in the right order:

Always load ingredients in the right order, as laid out in your bread making machine handbook. The rule of thumb is that it is either liquid first and yeast last, or yeast first, and liquid last. All other ingredients come in the middle.

Because moisture activates the yeast you don't want your yeast contacting the liquid ahead of time especially on a timed bake.

Basic Bread Recipe Sheet

White Loaf using a Panasonic bread making machine

500g Strong White Flour

320ml Water

1 tsp Yeast

1½ tsp Salt

2 tsp Sugar

1 tbsp Butter

Brown Loaf using a Panasonic bread making machine

500g Strong Brown Flour

325ml Water

1 tsp Yeast

1½ tsp Salt

2 tsp Sugar

1 tbsp Butter

Wholemeal Loaf using a Panasonic bread making machine

500g Wholemeal Flour

350ml Water

1 tsp Yeast

1½ tsp Salt

2 tsp Sugar

1 tbsp Butter



What do the Ingredients do?

Ingredient	Function

Health and Safety Rules that we must follow:

Group Names: _____

TEACHERS PAGE

Activity Three – Product Profiling through Sensory Analysis

Aims:

The aim of this activity is to introduce Product Profiling through sensory analysis as a tool to evaluate a food product.



Objectives:

By the end of the activity students will be able to:

- Identify the differences in the appearance, texture, aroma and flavour between three types of bread.
- Explain the sensory characteristics of the bread using Product Profiles to illustrate their opinions.
- Recognise that the type of flour used affects the finished loaf.

Resources:

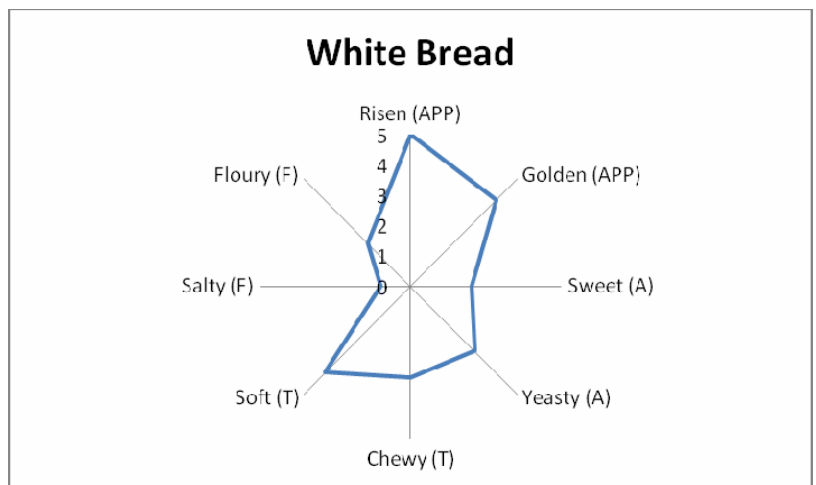
- *Sensory Analysis* worksheet.
- Three different types of bread, preferably white, brown and wholemeal.

Activity:

Producing a Product Profile is a graphical way of describing a food product. These profiles are referred to as “star diagrams” or in some text books as “star profiles”. If producing them using ICT, you need to use Excel and it is the “radar” graph that produces the correct graphical format. The activity is broken down into four descriptive areas; Appearance (APP); Flavour (F); Aroma (A) and Texture (T). Students are asked to generate words within these four areas that could be used to judge the bread product in front of them. For example; “Golden (APP)” is a descriptive appearance word and could be use to judge how golden a loaf is. Flavour (F) and Aroma (A) words tend to be the same and the bracketed letters used after the chosen word illustrate which sensory area the word is being use to judge. Texture words are used to describe how a product feels in your mouth and while a product may look “Crisp” it is only when sampled can it be judged how crisp.

It is worth demonstrating how to complete a “star diagram” at the start of the activity to ensure students are clear on the procedure.

E.g. the following completed star diagram illustrates a sensory profile for a white loaf:



As you can see the descriptors are written at the end of each leg of the star, (all descriptors should be written horizontally as shown), and the bracketed letters illustrate which sensory area the work refers to.

The grading system, 0-5, is always shown in the same format; 0 being in the centre of the star and 5 on the outside edge of each of the legs. Care must be taken to ensure the students do not use the terms “Good” and “Bad” as the number rating is actually 0 = “Not” and 5 = Extremely.

It is advisable to guide students away from using “opposites” in their descriptors, for example; “Hard (T)” and “Soft (T)”, as a rating of 1 against the descriptor “Hard (T)” would indicate that the bread was not at all hard and therefore must be soft.

It is also important to ensure that the rating given is marked actually **ON** the leg and not beside it as the students have to join their rating marks using a ruler which, when completed gives the diagram its distinctive “star” appearance.

Therefore, using the diagram above it is possible to describe the profile of the white loaf as; extremely well risen and very golden in colour; having a slightly sweet and yeasty aroma; being soft and slightly chewy in texture and having a slightly floury flavour but not salty.

This is an extremely motivating activity for students as they get to handle and taste the bread. Hygiene procedures should be followed and emphasized throughout and it is advised that suitable descriptor words are generated prior to handling or tasting the bread.

Once the activity has been completed for the three different breads, it is possible for the students to:

- Describe both verbally and in writing each of the breads.
- Compare and contrast the different bread.
- Suggest reasons for the differences in the profiles.
- Suggest an area for improvement for the bread.

Extension activity:

To stretch your more able students you could ask them to explain not just an area for improvement but exactly *HOW* would they improve the bread. For example; they might identify that the bread could be improved if it smelt a little sweeter.

Suggestions as to how to achieve this could range from a basic suggestion of adding a little more sugar to a more in depth suggestion of introducing some sort of fruit to the mixture.

An example of a completed *Sensory Analysis* worksheet.

Design and Make a Delicious Loaf of Bread

White Bread

Brown Bread

Word Bank:

Appearance: Golden; Brown; Risen; Holy; White; Crispy;

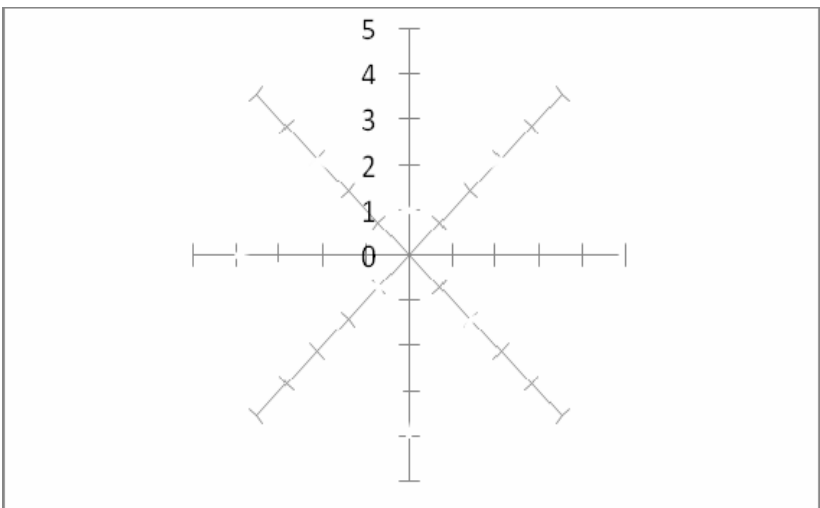
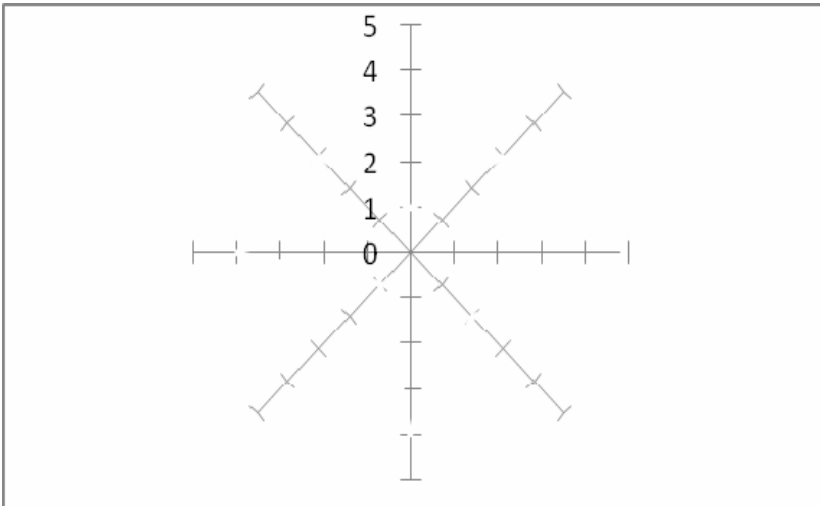
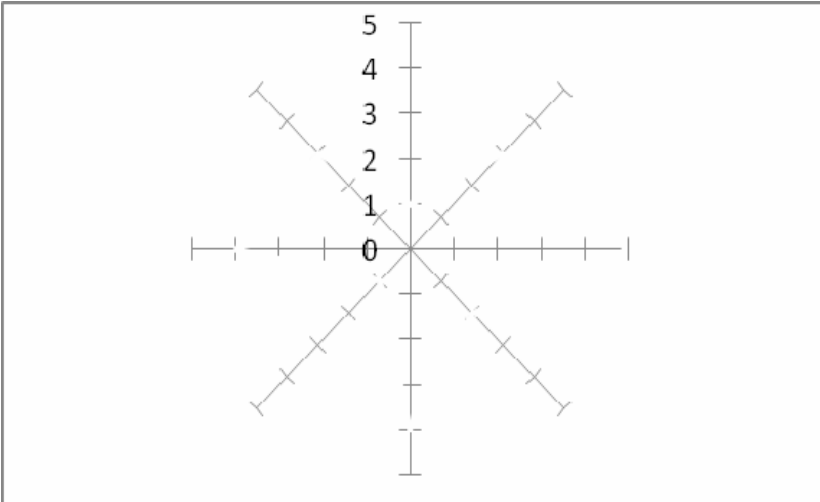
Texture: Chewy; Spongy; Crispy; Soft; Bitty;

Aroma: Sweet; Yeasty; Floury; Fruity;

Flavour: Sweet; Salty; Buttery; Fruity; Nutty; Milky

Group Names: _____

Sensory Analysis



Word Bank

Appearance:

**Golden: Brown: Risen:
Has holes: White:
Crispy:**

Texture:

**Chewy: Spongy: Crispy:
Soft: Bitty:**

Aroma:

**Sweet: Yeasty: Floury:
Fruity:**

Flavour:

**Sweet: Salty: Buttery:
Fruity: Nutty: Milky**

Group Names: _____

TEACHERS PAGE

Activity Four – Generation of Ideas

Aims:

The aim of this activity is for the students to generate ideas for their own bread.

Objectives:

By the end of the activity students will:

- Identify different ingredients that could be added to bread to give a variety of flavours, aroma and texture.

Resources:

- *Generation of ideas* worksheet.
- Personal and class research work.

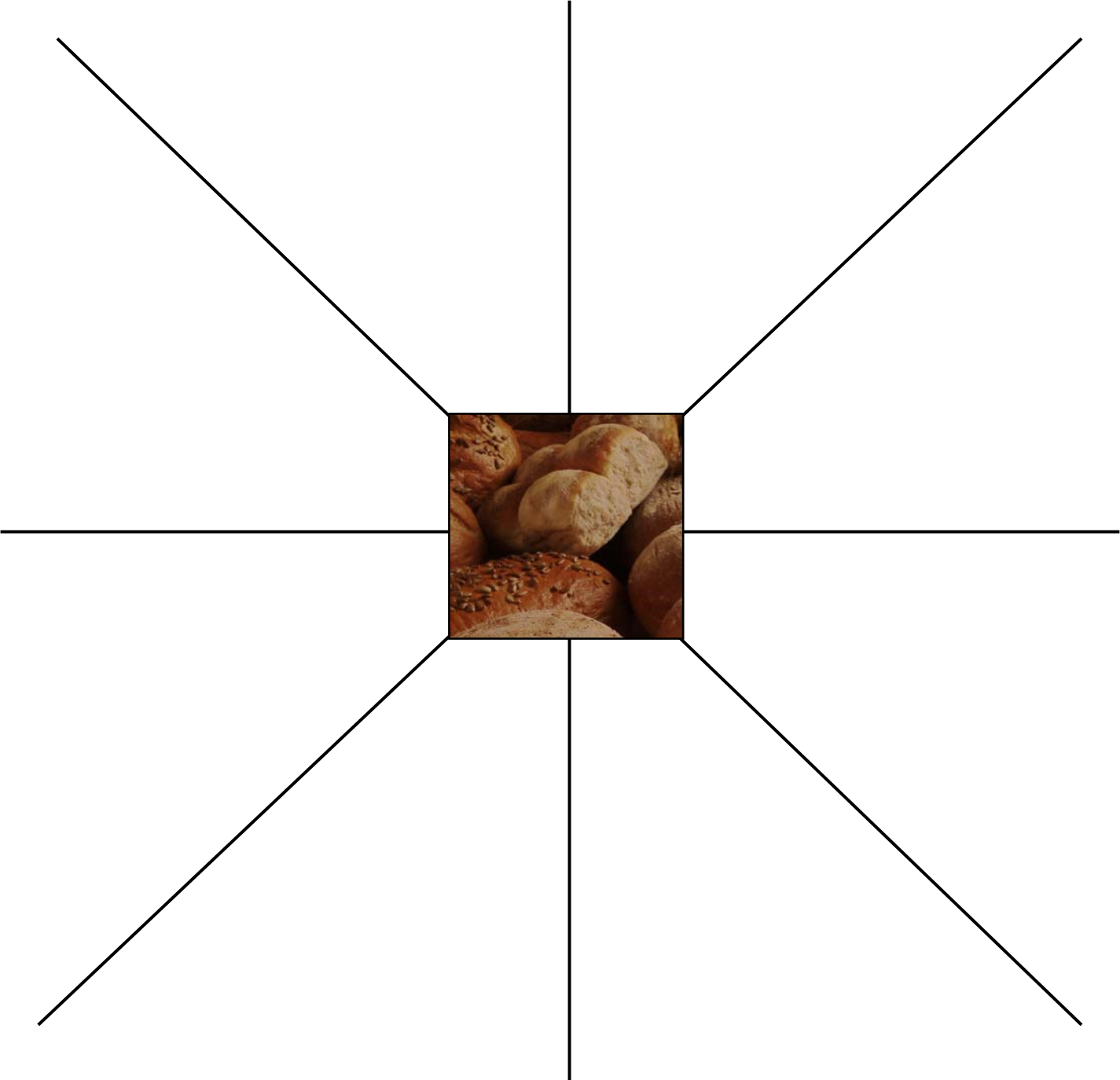
Activity:

This activity involves the groups of students brainstorming all the ingredients they can think of that could be added to bread. A high quality *Generation of Ideas* worksheet would contain a mixture of names of ingredients and sketches, be neatly coloured, full of ideas and well set out.

It is advisable to give a focus to this activity or give the groups a choice of focus; for example, Ingredients from around the world; sweet breads, savoury breads.

Using a completed *Generation of ideas* worksheet, students could then select ingredients to include in their bread and consider what effect the ingredients will have on the finished product.

Generation of Ideas



Group Names: _____

TEACHERS PAGE

Activity Five – Producing a Specification

Aims:

The aim of this activity is to use previous work, developed knowledge and understanding of ingredients to produce a specification that will clarify students' ideas and provide a reference for future evaluation.

Objectives:

By the end of the activity students will:

- Produce a written specification for their bread product.
- Consider the sensory and aesthetic qualities they would like to find in their bread product.
- Consider a variety of criteria on which they can judge their finished product.

Resources:

- *Specification* worksheet.

Activity:

A product specification describes the specific characteristics that the finished product must have. It acts as a tick list for the finished product and can be used in the evaluation to identify where and what changes need to be made to perfect the product.

As seen from the worksheet, the specification takes the form of a bullet point list and should cover the following areas:

- The type of bread product
E.g. our product will be a sweet bread
our product will be a savoury bread
- Specific sensory properties.
E.g. it will be well risen
it will have a golden, crispy crust
it will have a soft texture, etc.
- Estimated size and weight of the product
- Estimated cost of the product
- Details of specific ingredients
E.g. our product will contain nuts
- Details of serving suggestions
E.g. is suitable for making sandwiches

It is advisable to pose a number of questions for the students to consider as an aid to producing this piece of work. E.g. what sensory properties do you want your bread to have?, appearance?, aroma?, flavour?, texture?, how big is your loaf going to be?, height?, weight?

Specification

Our bread will be:

- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____
- _____

Group Names: _____

TEACHERS PAGE

Activity Six – Evaluation

Aims:

The aim of this activity is to evaluate the bread products. Evaluation is a very important element of the design process as through it students are able to reflect on their product, their knowledge and understanding and their practical skills.

Objectives:

By the end of the activity students will be able to:

- Use sensory analysis to determine the sensory qualities of their finished product.
- Compare their finished product to their specification.
- Reflect on what they have done well during this work and identify areas for personal development.
- Identify an area that could be improved.

Resources:

- *Evaluation* worksheet.
- Finished bread product.

Activity:

The following evaluation worksheet provides a format for the students to complete a detailed evaluation of their products.

The “hedonic scale” is a standard Food Technology tool to indicate an overall opinion of the product.

The blank star diagram enables students to use their skills and knowledge developed through the sensory analysis activity to illustrate the sensory characteristics of their product and use this to inform their written evaluation.

The “Our Bread” section enables students to demonstrate their understanding of their sensory analysis by writing a brief description of their bread.

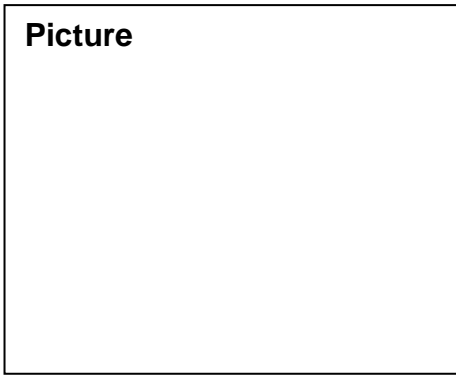
Space has been given for a photograph of the finished loaf and for details of the ingredients used, along with the functions of the ingredients.

The section “We did the following things well” allows for reflective thought and focus on all the things done well by the students. This tends to be the area that students struggle with!

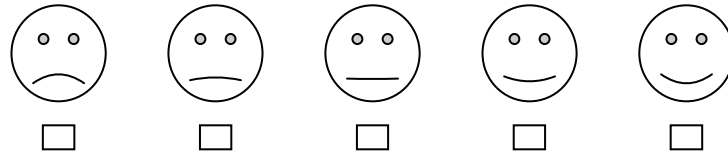
Do remind them of how they have worked well as a team, how they followed health and safety, developed and improved their measuring skills plus all the other things they did well.



Picture



Evaluation



Hedonic Scale

Word Bank

Appearance:

Golden: Brown: Risen: Has holes: White: Crispy

Texture:

Chewy: Spongy: Crispy: Soft: Bitty

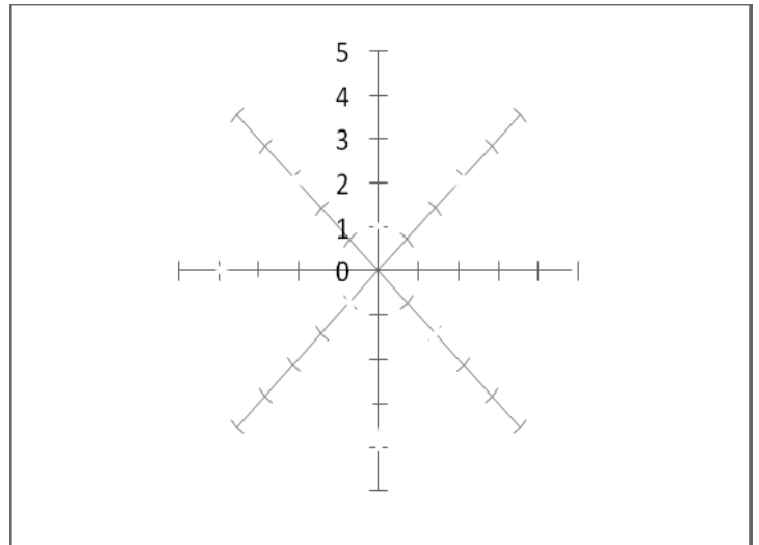
Aroma:

Sweet: Yeasty: Floury: Fruity

Flavour:

Sweet: Salty: Buttery: Fruity: Nutty: Milky

Final Idea/Ingredients	Function



Explain why you have chosen your ingredients.

Evaluation:

Our bread _____

We could improve our bread by _____

We did the following things well _____

Group Names: _____

TEACHERS PAGE

Additional learning activities

- Research the milling process, identifying the stages in the process from wheat to flour.
- Devise a student questionnaire focusing on preferred bread products. Present resulting data in graph format.
- Write and illustrate a classbook of bread recipes.
- Research bread products from different countries and present findings appropriately.
- Look at examples of recipes and create their own.
- Children could find out more about bread products from books, by looking at products in the shops and finding out about other people's preferences.
- Visit a local bakery or store, or arrange a visit by a local baker.