

**Nuffield Design & Technology
working in the curriculum**



**What shape will
your pastry be?**
seven hours work

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1

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design context

Most children love jam tarts. They are widely available from major food manufacturers as well as from the local bakery. Making your own jam tarts from scraps of pastry may be a fond memory from your own childhood. This activity will highlight the differences between home-made and commercially produced food products. Your class will learn to record their responses to appearance, taste and texture. They will explore the ingredients used, nutritional values and packaging. The whole class will learn to make traditional jam tarts, model ideas for pastry constructions and finally, design and make new pastry products to satisfy identified consumers.

learning purposes

In this unit children will learn:

- ◆ to examine a common commercial food product, considering cost, packaging, ingredients, nutritional information and sensory appreciation (e.g. taste, texture, smell, colour) and compare with the home-made version;
(Session 1)
- ◆ to design and use a simple questionnaire to gather information about the needs and preferences of a particular group of consumers;
(Session 2)
- ◆ to use ICT to analyse the gathered information and present their findings;
(Session 3)
- ◆ to make traditional jam filled pastry tarts by following a recipe;
(Session 4)
- ◆ to model a variety of design ideas using Playdough;
(Session 5)
- ◆ to prepare and bake a new pastry product which they have designed and to collect consumer responses to it.
(Session 7)

the small tasks

the focused practical tasks

- 1 Investigating jam tarts
60 minutes
- 2 Making traditional jam tarts
60 minutes
- 3 Finding out consumer preferences
60 minutes
- 3 Analysing consumer preferences
60 minutes
- 4 Modelling design ideas
30 minutes
- 5 Writing the specification
30 minutes

the big task

the design and make task

The big task is to design and make a new pastry product for a particular group of people. The product will be based on the children's experience of the traditional jam tart and each child will carry out market research to identify the needs and preferences of their consumers.

60 minutes

Evaluation

30 minutes

Unit review

30 minutes

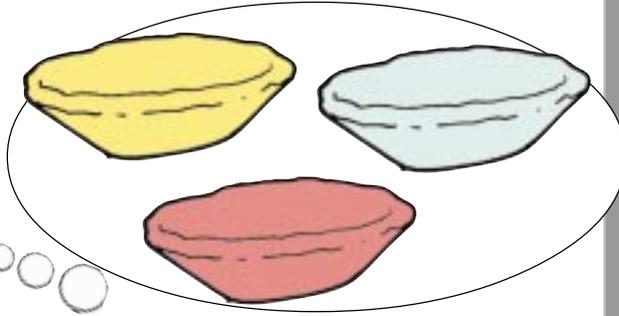
this hand tart has been carefully cut out too large to make an allowance for a low pastry wall to be formed by carefully folding up the edges. This retains the apricot jam which was added before baking. The shiny red finger nails are cherries sliced into quarters with a half cherry for the thumb nail; all added after baking when the tart had been allowed to cool



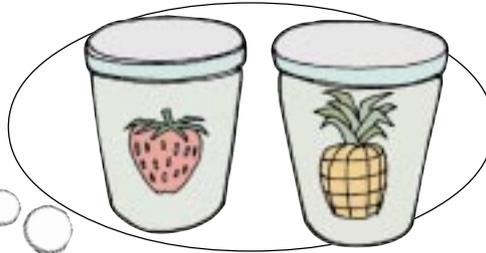
design decisions

Children will decide the following:

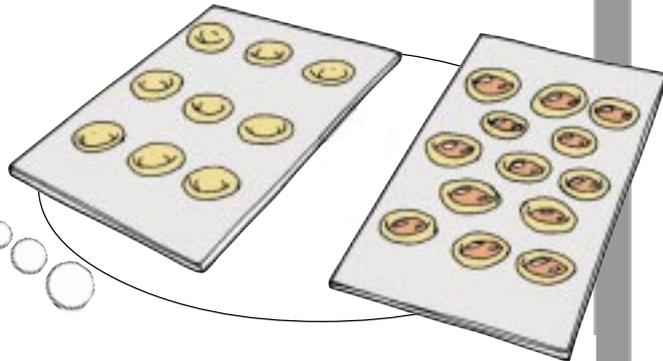
- ◆ what colour the pastry will be
 required learning in Sessions 3 and 4,
 design decision made in Session 6;



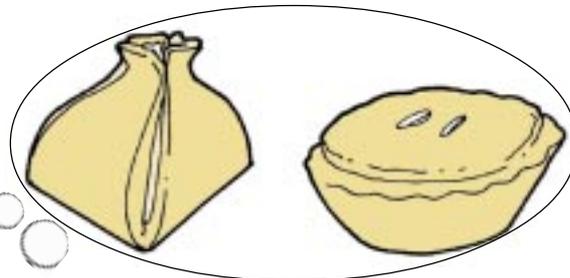
- ◆ which jam(s) to use as filling
 required learning in Sessions 3 and 4,
 design decision made in Session 6;



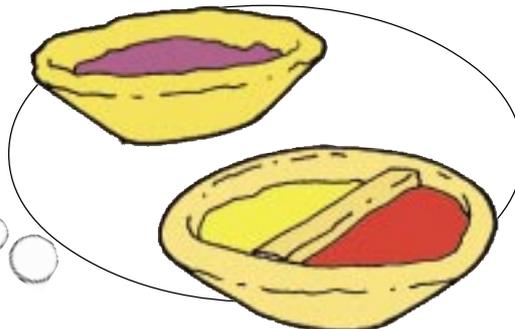
- ◆ whether to bake the pastry blind then add filling, or to add filling before baking
 required learning in Session 2,
 design decision made in Session 6;



- ◆ the structure and shape of the pastry case
 required learning in Sessions 2–5,
 design decision made in Session 6;



- ◆ where the filling will go in the pastry case
 required learning in Sessions 2 and 5,
 design decision made in Session 6.



investigating jam tarts

Teacher input

Tell the class that they are going to compare different sorts of jam tarts including home-made jam tarts. If there are children in the class whose cultural backgrounds do not include baking pastry, you may need to make a brief introduction to jam tarts as a traditional food. Ensure that there are jam tarts from different price ranges. Use the following questions to help the class make the comparison.

- ◆ What does the packaging suggest about the product?
- ◆ What information is there on the packaging to tell you about the ingredients in this product?
- ◆ How does this compare with the ingredients for home-made tarts?
- ◆ What else has been added to shop-bought tarts? Can we explain why?
- ◆ What different types of food do the tarts contain?

suggested timing
60 mins

investigating jam tarts (continued)

- ◆ Are all of these needed for a healthy diet?
- ◆ Why wouldn't it be healthy to eat just jam tarts?
- ◆ What is the cost per tart for the shop-bought tart?
- ◆ What is the cost per tart for the home-made tart?
- ◆ Which tarts are better value?

Pupil activity

Organise the children into groups of four and ensure that each group has at least two different sorts of jam tart. Explain that they are going to compare what the tarts look and taste like. Each group should decide on the criteria they will use for the comparison and draw up a table to record their findings. Less able children might need to be given a list e.g. shape, size, colour, smell, taste, texture of pastry and filling (what they feel like in your mouth).

Use a selection of these evaluations, examples of jam tart packaging, information from recipes and prices of tarts and ingredients to produce a display that answers the questions discussed at the beginning of the lesson.

**Resources**

Stimulus: Packet(s) of commercially produced jam tarts, some home-made jam tarts, recipes from magazines or cookery books, costs for ingredients in home-made tarts, cost of the packet(s) of shop-bought tarts, photocopied enlargement of nutritional information on the packaging;

Consumables: paper, paper plates or table cover for food samples;

Tools: pencils, pens, rulers.

Health and safety check

It is important to find out if there are children in the class who are sensitive to certain foods. Send home a list of all the ingredients to be used so that parents have an opportunity to warn of any potential problems. Discuss the hazards and risks involved in tasting food products and how the risks can be controlled by observing basic food safety rules. Discuss the additional hazards and risks caused by sharing this activity and how the risks can be controlled by observing basic food safety rules.

SECTION 4

teaching the unit

session
two

making traditional jam tarts

suggested timing
60 mins

Teacher input

Tell the class that today they will make traditional jam tarts and that to do this they will need to weigh out the ingredients accurately and follow the instructions precisely. You may have your own favourite recipe for pastry or you can use the one in the resources section. Explain that you or another adult will supervise them when they are using the cooker. Tell them that they will be able to taste the jam tarts once they have cooled down.

Pupil activity

Explain to the class that they will work in groups of four and that it is important for everyone in the group to have the chance to weigh, mix and rub in the pastry. Tell the class that there are clear written instructions to follow so that each group can make traditional jam tarts; some baked blind (i.e. with no filling and filled later) and some baked with the jam in the tart. Explain that they can taste the tarts only once they have cooled down and that they should compare the texture and taste of the different methods. Tell the class that each group should use a table to record the comparison. Add some of the comparison tables to the class display.



Resources

- Stimulus:** recipe (there is a ready-to-copy sheet in 'Resources section');
- Consumables:** ingredients for pastry;
- Tools:** mixing bowl, sieve, round bladed knife, tablespoon, rolling pin, surface for rolling out, pastry cutters, tartlet baking tins, cooling racks, weighing scales for food use, oven gloves, pens, pencils.

Health and safety check

Discuss the hazards and risks involved in using tools to prepare food products and how the risks can be controlled by taking care and using the correct procedures. Revisit the discussion about controlling risks when handling food materials.

finding out consumer preferences

suggested timing
60 mins**Teacher input**

Tell the class that they will be designing and making a special, modern version of a jam tart for a particular person – a friend or a member of their family. Tell the children that in this session they will design a short questionnaire to gather information from their consumer and when they have used this they will be able to analyse their findings using ICT in the follow-up session. Explain that they will need to find out about the person's preferences for size, shape, colour, filling, and any non-permitted ingredients. They may think of other questions themselves, but if the answers are going to contribute to a class database, the whole class will need to agree on the set of questions to be used. Explain that once the data from a common set of questions is entered into a database, they will be able to interrogate the database to see trends and patterns in consumers' responses.

Pupil activity

The children will work in groups to draw up and agree on a class questionnaire sheet, which they will use to find out the preferences of their consumers. Explain that if the consumer is a member of the class, the interview can take place in school time, but if the consumer is a friend from outside school, or a member of their family, the interview will have to be done for homework. The children then use their questionnaires to interview their consumer and record the responses.

**Resources****Consumables:** paper;**Tools:** pens, pencils.**Health and safety check**

Discuss the hazards and risks involved in carrying out a simple survey and how the risks can be controlled by polite behaviour and consideration for others.

SECTION 4 teaching the unit

session
four

analysing consumer preferences

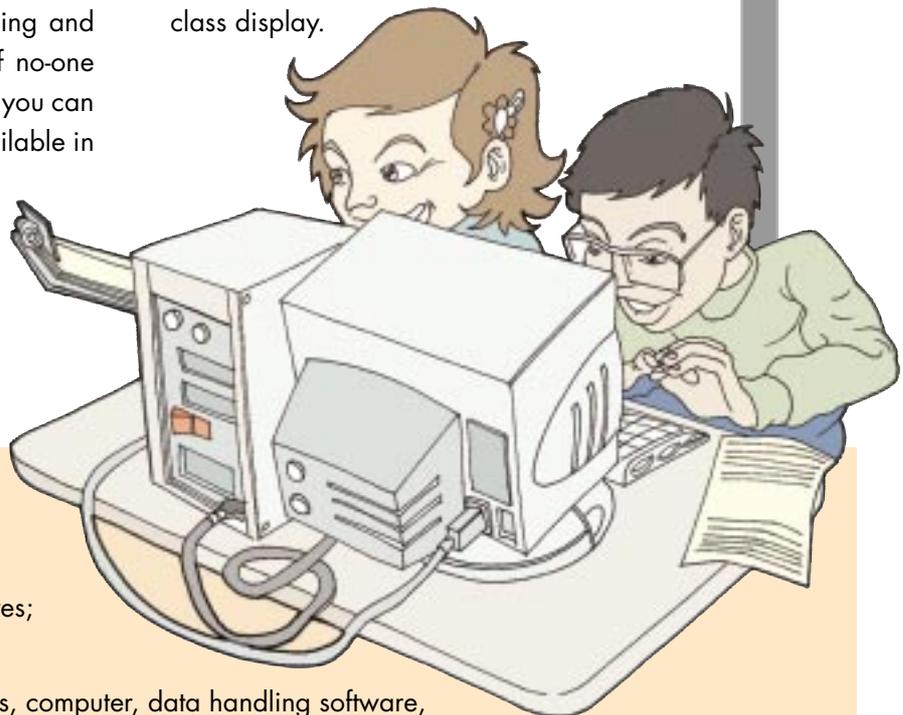
suggested timing
60 mins

Teacher input

You may have to set up the data file on the computer or this could be a task for an able group to do under your supervision. Typing in the data from the questionnaires can be done as a rolling activity during the lesson. The simplicity of this part of the activity will depend on the data handling software you use. Each child should know the responses from their own consumer at least, but this is a good opportunity to interrogate the file together and find out patterns of responses. These will inform the later designing and also the provision of resources. If no-one likes strawberry jam, for example, you can exclude it from the ingredients available in the baking sessions.

Pupil activity

Children will enter the results from their questionnaire sheets onto the class database (this could be started before the session). Then, when the database is complete children should interrogate it in groups of two or three. They should print out those charts which make clear the answers to the questions on their questionnaires. Each group should present their findings to the rest of the class who will discuss them. The most effective charts can be kept to form a class display.



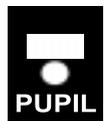
Resources

- Stimulus:** completed questionnaires;
- Consumables:** paper;
- Tools:** pens, pencils, computer, data handling software, printer.

Health and safety check

Discuss the hazards and risks caused by using ingredients which cause allergic reactions and how the risks can be controlled by careful recording of information provided by the consumer.

modelling design ideas

suggested timing
30 mins**Teacher input**

Tell the class that today they can experiment with design ideas to explore what their new pastry product will look like. Explain that they will use Playdough for this as it can be easily shaped but emphasise that it cannot be eaten. Remind the class that pastry changes shape when cooked losing detail and that 3D structures will need support during cooking. Suggest the following ideas for pastry containers that they might explore:

- ◆ round case sectioned off with strips of pastry with each section filled with a different coloured jam;
- ◆ shaped cases made using ready-made shaped pastry cutters;
- ◆ a square or rectangular shaped pinched up at the corners;
- ◆ a hand made shape or structure to reflect consumer's interest, e.g. football boot, dinosaur, Diwali lamp.

Pupil activity

Each child then experiments with the Playdough or similar modelling material to develop ideas for their new pastry case. You may need to remind them that pastry is not like bread or biscuit; it can be very dry to eat if there isn't sufficient filling to balance the amount of pastry. Towards the end of the session the children should form small groups and discuss their designs. If there is one innovative design idea that several children want to copy, the designer should be acknowledged for making such a good contribution. Add the models to the class display.

**Resources**

- Stimulus:** results of consumer survey;
- Consumables:** Playdough;
- Tools:** rolling pins, surface for rolling out, round bladed knife for shaping/cutting, cutters.

Health and safety check

Revisit the discussion about controlling risks using tools to prepare food materials and ensure that the children understand that playdough should not be eaten.

SECTION 4 teaching the unit

session
six

writing the specification

Teacher input

Tell the class that every child has to record their design decisions on a specification sheet. Explain to the children that they will need to record decisions about overall structure and shape, pastry colour, type of filling, method of baking and where the filling should be placed. Tell them that one way to do this is with a carefully labelled diagram. There is a ready-to-copy 'Tarts specification' sheet available, which you may wish to use with some children.

Pupil activity

Each child will produce a specification. Encourage the children to consult their survey results, look at the Playdough models and interrogate the class database to inform this specification. Discuss the emerging designs with individual children to ensure that they are not over ambitious and that you can provide the ingredients.

suggested timing
30 mins



Resources

- Stimulus:** survey results from Session 3, playdough models from Session 4;
- Consumables:** paper, 'Tarts specification' sheets;
- Tools:** pens, pencils, coloured pencils, rulers.

Health and safety check

Revisit the discussion about controlling risks when handling food by asking the children to draw a picture of a part of the making process that may require extra care e.g. ensuring utensils are clean.

SECTION 4

teaching the unit

session
seven

the big task: making new pastry products

suggested timing
60 mins

Teacher input

Tell the class that today they will make the pastry products they have designed. Remind the class to use the specification they produced last session and make sure that they each have a copy of the pastry recipe you wish them to use. Explain that their consumers should taste and evaluate the products during the session, or as soon as possible afterwards, and their responses should be recorded. There is a ready-to-copy 'Tarts consumer tasting sheet' available.

Pupil activity

Tell the class that they should work in groups to make the pastry, but that each child will need to work individually to construct their products. If there are other

adults available to help, make sure that they know that each child is following an individual specification. Once the pastry products have been baked and cooled slightly, the consumers should taste them. Each child should record the consumer's response.

Extension work

Children who finish early or who need an extra challenge could be asked to do the following.

- ◆ Draw up a plan for a production line, producing enough pastries for the whole school.
- ◆ Design an advertisement for their new product, highlighting its unique features.

Resources

- Stimulus:** 'Tart specifications' from previous session;
- Consumables:** ingredients for pastry, jams for fillings, paper, 'Tart consumer tasting sheet';
- Tools:** mixing bowl, sieve, round bladed knife, tablespoon, rolling pin, surface for rolling out, pastry cutters, tartlet baking tins, cooling racks, weighing scales for food use, oven gloves, pens, pencils.

Health and safety check

Discuss the hazards and risks involved in eating the jam tarts and how the risks can be controlled.



evaluating the final product

suggested timing
30 mins

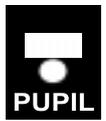
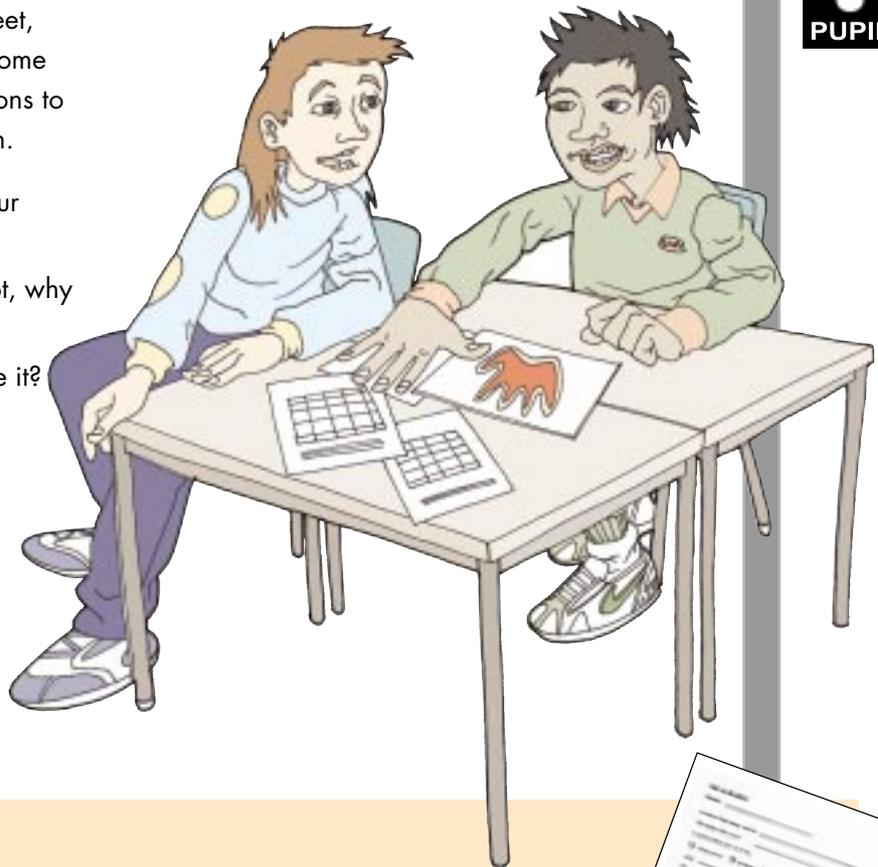
Teacher input

Tell the class that today they will evaluate their finished products by comparing them with the specifications they wrote in Session 6. Emphasise that the consumers' responses are important and they should use these in their evaluations. There is a ready-to-copy 'Tart evaluation' sheet, which you may wish to use with some children. Use the following questions to help the class make the evaluation.

- ◆ Does your product look like your design? If not, why not?
- ◆ Did your consumer like it? If not, why not?
- ◆ What could you do to improve it?

Pupil activity

Each child should complete an evaluation form and discuss with a partner the differences between the product they actually produced and the specification, if any. They should also discuss the consumer's responses.



Resources

Stimulus: 'Tart specification' sheets, 'Tart consumer tasting sheets';

Consumables: paper, 'Tart evaluation sheets';

Tools: pens, pencils, rulers.

Health and safety check

Ask the children to discuss, when they are in their pairs or groups, all the safety rules they remember observing during the making session.



SECTION 4 teaching the unit

session
nine

unit review

Teacher input

Explain to the class that it is important to think about how to get better at design & technology and that they can do this by discussing the following questions.

- ◆ Which parts did you enjoy most – comparing home-made and shop-bought tarts, making tarts, gathering and analysing data, designing new tarts?
- ◆ Which parts did you find easy?
- ◆ Which parts did you find difficult?
- ◆ Which parts did you get better at?
- ◆ Did you help each other?
- ◆ What could have been done better?
- ◆ How could these have been done better?

Pupil activity

The should discuss the questions in groups and when they have finished you should ask each group to make a short report to the class. Based on these reports the class should agree a statement of improvement for their next design & technology lesson.



suggested timing
30 mins



Resources

Stimulus: class display from Sessions 1 and 3, playdough models from Session 5, 'Tart evaluation' sheets, 'Tart consumer tasting sheets'.

Health and safety check

Discuss whether the class used hazard recognition, risk identification and risk control to design and make safely.

SECTION 5

resources and links

vocabulary

Session 1	Session 2	Sessions 3+5	Session 6	Session 8
product, packaging, advertisement, ingredients, nutrition, traditional	consumer, questionnaire, data handling, preferences, dietary needs, allergies. survey	interrogate, design ideas, modelling, experimenting	design specification, labelled drawings	evaluation

resources summary

	Stimulus materials	Consumable	Tools
Session 1	packets of commercially produced jam tarts, some home-made tarts recipes from magazines or cookery books, costs of ingredients and shop-bought tarts, photocopied enlargement of nutritional information on the packaging	paper, paper plates or table cover for food samples	pens, pencils, rulers
Session 2	recipe	ingredients for pastry, jams, paper	mixing bowl, sieve, round bladed knife, tablespoon, rolling pins, pastry cutters, surface for rolling out, tartlet baking trays, cooling racks, scales, oven gloves, pencils
Session 3		paper	pens, pencils
Session 4	completed questionnaires	paper	pens, pencils, computer, data handling software, printer
Session 5	results of consumer survey	playdough (see recipe sheet)	rolling pins, surface for rolling out, round bladed knife for shaping, cutters
Session 6	survey results from Session 4, playdough models from Session 5	paper, 'Tarts specification' sheets	pens, pencils, rulers, coloured pencils
Session 7	'Tarts specification' sheets from previous session	ingredients for pastry, jams/fruit for fillings, 'Tart consumer tasting sheets'	mixing bowl, sieve, rounded bladed knife, tablespoon, rolling pins, pastry cutters, tartlet baking trays, cooling racks, scales, oven gloves, pencils
Session 8	'Tart specification' sheets, 'Tart consumer tasting sheets'	paper, 'Tart evaluation' sheets	pencils, pens, rulers
Session 9	Session 1 display, playdough models 'Tart evaluation' sheets, 'Tart consumer tasting sheets'		

links to other subjects

Literacy

There are opportunities to write instructions and non-chronological texts in this module.

Instructions could be written for making their jam tarts so that others may also make them.

If the children have recorded their observations about jam tarts in a chart during session 1, these charts could be turned into a writing frame to write a non-chronological report comparing the jam tarts.

Surveys and questionnaires can be studied in order to look at the type of questions asked and responses required so that questionnaires can be devised in order to discover the type of jam tart that the consumer wants.

Numeracy

During the making of jam tarts and the special jam tarts there are plenty of opportunities for estimating, weighing and reading scales.

This unit also supports 'organising and interpreting data' in the National Numeracy strategy teaching programme for Year 4.

Science

Work in this unit related to nutrition and a healthy diet builds on the QCA Primary Science Unit 3A (Year 3) 'Teeth and eating'. There are also opportunities for discussion about materials changing when they are heated; how some changes are reversible and others are not.

ICT

This unit links well with the QCA ICT Unit 4D (Year 4) 'Collecting and presenting information: questionnaires and pie charts'.

Recipe for playdough

3 cups flour
one and half cups salt
2 teaspoons cream of tartar
1 tablespoon cooking oil
2 cups water
food colouring if wanted

Method

- 1 Mix thoroughly.
- 2 Stir over heat until a fairly thick consistency achieved.
- 3 Allow to cool before use.



Recipe for jam tarts

225g (8oz) plain flour

100g (4oz) hard margarine

pinch of salt

up to 3 tablespoons water

Method

- 1 sift the flour and salt into a bowl;
- 2 rub in the cubed margarine with fingertips;
- 3 when the mixture is crumbly sprinkle some of the water over it;
- 4 mix and bring the mixture together with a knife;
- 5 add more water as needed and with hands form a ball of dough;
- 6 if possible leave it in a fridge for a few minutes before rolling out;
- 7 roll out the pastry dough on floured surface and cut into shapes with pastry cutter;
- 8 press gently into greased tartlet tin;
- 9 prick bottom of pastry in tin; add spoonful of jam and some water to keep it from burning;
- 10 bake in oven for 10–15 minutes at 400°F (200°C) Gas mark 6 until pastry is cooked;
- 11 put tin on cooling rack until tarts are cool then ease them out of tin with a knife.

You could also bake the pastry cases 'blind' and fill them with jam later. They will have a different texture and taste.



Tart specification

Name: _____

I will make a filled pastry case for _____

The pastry will be this colour _____

I will use this/these jams as filling

blackcurrant strawberry apricot raspberry

other _____

I will bake the case first then add the filling.

OR

I will add the filling before I bake the case.

Here is a drawing of the pastry case I will make. I have marked where the filling will go.

Tart consumer tasting sheet

My name _____

This is the consumer who answered these questions: _____

Does this filled pastry case look appetising?

1 2 3 4 5

very appetising

really nasty

Try the pastry, How does it taste?

1 2 3 4 5

delicious

horrible

Try the filling. How does it taste?

1 2 3 4 5

delicious

horrible

How does it all taste together?

1 2 3 4 5

delicious

horrible

Is this the type of pastry product you wanted? _____

How could it be improved? _____

Tart evaluation

Name: _____

I made a filled pastry case for _____

The pastry is this colour _____

I used this/these jams as filling:

blackcurrant strawberry apricot raspberry

other _____

I baked the case first and then added the filling.

OR

I added the filling before I baked the case.

Here is a drawing of the pastry case I made. I have marked where the filling went.

Acknowledgements

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