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LESSON PLAN FOR BEETROOT AND CHOCOLATE CAKE

EARLY YEARS THROUGH TO KEY STAGE 3

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[BEETROOT & CHOCOLATE CAKE - NUT FREE](#)

Topic

Take your pick! This is the beauty of his recipe it can fit into all areas of the curriculum.

Aims

To work cross curriculum by teaching English, Maths, Science, Art and Design, Design and Technology, Cooking and Nutrition, Geography, History.

Age

Early years, through to key stage 3

Level

Key stage 1, 2 and 3

Time

Remember the preparation time, if you are using school grown beetroot make sure you wash the dirty beetroot in a bucket outside with the outside scrubbing brush.

Boil, steam or roast it for around 45 minutes (microwave in about 10 minutes). Once cooled peel ready for the children or if you feel they could peel it with their fingers. Including cooking time 120 minutes.

Materials - recipe at bottom of lesson plan

If all children made 1 plus 1 demonstration for the teacher. You can get 12cm cake tins and put ½ recipe in each tin.

You could also make one recipe per table (6 children). Then they will be able to have a taste or take it home. Multiply amounts in recipe at bottom of lesson plan to make 6 x 24cm tins.

Or make one 24cm cake as a demonstration.

31 x 12cm cake tins
3100ml vegetable oil
1.55kg rice flour
1.55kg rolled oats - blended till fine
16tsp or 62g, 4g per tsp bicarbonate of soda
1,160 kg coco powder (buy the one with no sugar added)
3,900 kg caster sugar
3,900 kg cooked and peeled beetroot
31 large free range eggs

Flash cards for beetroot and oats
1 glass bowl for demonstration for the teacher
Plastic bowls for children
Wooden spoons
Spatulas
Blender or food processor for the teacher to take charge of
Cake tins
Oven/s for the teacher to take charge of
Oven glove for the teacher
Baking parchment
Metal skewer for the teacher

Introduction

In this lesson the children will be learning the following skills;

- Weighing and measuring using spoons and cups, measuring liquids (oil), using balance and digital scales. All ingredients
- Using a sharp knife. To cut the beetroot into ¼'s.
- Grating soft foods. Grating of the beetroot.
- Cracking eggs.
- Beating eggs.
- Adding liquid to flour.
- All in one cake mixing.
- Scraping out a bowl with a spatula.

- Grease and lining a cake tin.
- Dividing mixture into tins.
- Beating ingredients together.
- Decorating.

Procedure

- See recipe at bottom of lesson plan for method.
- Make sure you clean all the environment before cooking. I recommend you buy a wipeable table cloth for the tables and store it away dry and only use it for cooking.
- Line the children up to wash their hands, put on an apron, tie their hair back and remove nail varnish.
- Weigh the ingredients out in a maths lesson the day before and set aside on trays. Put out the ingredients and equipment the night or morning before the cooking. Or weigh and measure the ingredients out for the children and lay out on the tables before the children arrive along with the equipment.
- The children could wash up if there is a suitable height sink and the water is not too hot. Or the adults clean as part of their clean down at the end of the day.

Follow up tasks

- If you have lots of beetroot try and think of another recipe including beetroot. Put this time make it savoury. Maybe something that could be put into a packed lunch.
- For example a salad make with cous cous or bulgar wheat, beetroot and potato salad, beetroot, pea and feta cheese salad. Roasted vegetable parcel with garlic and olive oil. Beetroot and apple/orange/raspberry smoothie.
- Maybe a project on breakfast enriching their knowledge on oats. Make porridge but use natural sugars like honey and maple syrup. You could discuss the maple syrup trees if you choose to focus on recognising trees. Also make pancakes using oats not flour. Flapjacks with seeds in but remember avoid sesame seeds as they are on the allergy list.

Health and safety

- The base recipe contain **ground almonds** which is classified as a nut. Most schools are nut free zones, **therefore we have substituted the ground almonds for oats**. We recommend a letter is sent out to parents and carers asking what allergies the children have before any practical cooking takes place within school.
- Safe handling of raw eggs. Teach the children to crack an egg with a table knife over a small bowl. This way prevents shell falling into the cake mix, as you can remove any shell from the small bowl before adding it into the cake mix. Make sure hands are washed thoroughly after use to prevent salmonella poisoning. Also you can tell if an egg is fresh by the smell and how prominent the egg yolk stands in the centre of 2 layers of white. The flatter the whole egg the older the egg. Talk to the children about the “story” that is on the outside of the egg. What the lion mark means, it has be quality assured and inoculated to prevent diseases like salmonella. Also the best before date, when the egg is no longer fresh to use. The role of eggs in a sponge is to act as a leavening agent to create and maintain the air bubbles to make the sponge light.
- Using a hot oven. The adult takes responsibility in using the oven.
- Allow the cake to cool before removing it from the tin. Especially before decorating.
- Using a blender or food processor. The adult would take full charge of this, as there is often an exposed blade.
- **Allergies nuts and eggs.**
- Grating. Children can cut their knuckles on graters, see below for the teaching point.

Healthy eating messages

- I recommend you make or buy some flash cards of fruit and vegetables and how they grow.
- Eat as part of a balanced diet. The cake contains sugar, part of a balanced diet and the addition of beetroot makes it slightly better than cakes with confectionary in it.
- Using oil as the fat in the cake rather than butter. This is reducing the saturated fat in the recipe.
- Increase the amount of fruit and vegetables. Working towards the 5 a day. An example of how vegetables can be used in baking. Parsnips, courgettes and butternut squash can be use too once cooked.
- Nutrition benefit of beetroot. Great for liver function and cancer suppressing. High in fibre and improve bowl function. Prevents constipation and lowers cholesterol and can help in the prevention of heart disease and strokes.

- Discussion on coco powder. It is best to use the coco powder without sugar in it. This will reduce the sugar intake.
- Eggs are part of a healthy diet. Contains protein, vitamin and minerals. Essential fatty acids and some eggs have omega 3 fatty acids. They also contain cholesterol. Protein is good for growth and repair for the body.
- Using sugar and the connection between tooth decay and weight gain, sugar swaps.
- If nuts are allowed, teach the children to benefits that nuts can have as part of a healthy diet. Almonds contain calcium, good bones and teeth and vitamin E great for healthy skin.

Skills

- Weighing and measuring. The weighing and measuring, making the cake, baking the cake and decorating the cake does not have to be done in all one lesson. The ingredients could be weighed and measured the day before as part of a numeracy lesson. Making and baking one day and the decorating another. Remember not to do too much especially if you are making it as whole classroom cooking. The children don't have to weigh and measure every time you cook, ingredients can be already weighed and measured and placed on a tray ready for the children to cook.
- Cracking and beating eggs. Early years are more than capable of cracking eggs. Taught as mentioned above.
- Grease and lining a cake tin. This is great for yearly years and above as it improves their motor skills. Drawing around the tin with baking parchment and cutting it out. Using their hands to smear the butter all over the tin. Teaching the children about their hands are the best tools in the kitchen. As often as you can use their hands as some children might not have access to certain tools, it opens up a while new world to them.
- Mixing. Teach the children to hold the side of the bowl with one hand and stir with the other, slowly, as some children mix very quickly and lose their mixture.
- Using a blender or food processor. The adult will take responsibly for this but do it in front of the children so they can see what happens in a blender or food processor. Talks to the children about the sharp blade and not to touch it. And when washing up never put the blade in the washing up bowl covered in bubbles as someone else could come along and place their hand in the sink and cut themselves.
- Could grate the beetroot instead, in increase their skills. You could ask the children to grate the cooked beetroot instead of blending it, as it gives another skill to the children. You must find a grater that is right for their small hands. Don't give them a massive grater that they can't hold or control. Teach the children to hold the top pushing their weight down to steady the grated. Hold the vegetable like a microphone so all their fingers are away from the tiny blades. With a sweeping motion drag the vegetable down and when it gets close to their hands the teacher takes over to do the last part to prevent cuts.

Ingredients and cultural diversity

- Oats. They are classified a cereal. Where they grow? And why? The health benefits of oats. There are also lots of alternative flours that are available especially if there is a wheat allergy within your class or school. They do react quiet differently so make sure you test the recipe first before cooking with the class. Some absorb more liquid than others for example.
- Almond is a nut. Where do nuts grown? And what it is that makes some people allergic to them. They grow on trees, they cause an overreaction of the immune system.
- What is bicarbonate of soda? Why is it used, for what purpose? It is a leavening agent. It reacts with acidic components in batters. It releases a gas called carbon dioxide which makes the cake rise.
- Classification of beetroot. Why is it a prominent ingredient in Eastern Europe? This is a good chance to talk about how the weather of a country effects what they grow. Beetroot can grow in cold climates, it can be stored for months. Some countries like to pickle their beetroot which keeps it for longer, a method of preservation, like salting, curing etc. Most children who have had an experience with beetroot have had or seen it pickled. So don't be surprised when they say they don't like it. Once tasted cooked beetroot the children soon learn that it has a natural sweetness to it, that's why we can use it in cakes. If you were to roast the whole beetroots you can show the children the black sticky liquid that comes out of the beetroot that is natural sugar that has been caramelised. Why not buy a range of products which has beetroot in it. Cooked, pickles, raw, juice etc.

Provenance and sustainability

- If you have growing facilities in school sow your seeds in March, April, May, June and July to harvest June, July, August, September and October. NOTE; remember to sow early on in the year and harvest early as there is often no one to harvest over the summer holiday. If you sow early you can harvest early before the summer holidays.
- Planting and harvesting will introduce the children to seasonality.
- It is grown in Great Britain.
- The leaves can be eaten too, use as you would spinach. The leaves are beautiful can could be used in an art lesson to draw or rub over with crayons.
- Describe what environment is needed for a plant to grow.

Links to the national curriculum

English-

Listen and respond appropriately to adults and their peers.

While the teacher demonstrates the children will be listening, responding and asking questions.

Ask relevant questions to extend their understanding and knowledge.

The children will be encourage to ask questions on why certain things are done or added, for example what is the role of the eggs.

Use relevant strategies to build their vocabulary.

The children will be building their vocabulary by the teacher introducing new words including ingredients, methods of cooking etc.

Articulate and justify answers, arguments and opinions.

The children will be encourage to share their opinions on ingredients and methods, likes, dislikes and why?

Give well-structured descriptions, explanations and narratives for different purposes, including fro expressing feelings.

It is a good idea to have a word bank on the wall of the classroom to increase and encourage feelings, descriptions, explanations etc.

Maintain attention and participate activity in collaborative conversations, staying on topic and initiating and responding to comments.

All children will stay on topic as they will be too busy to engage in other activities. As all ingredients and equipment will be set out for them.

Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ides.

What will happen to the cake in the oven? What is the role of the baking powder? What will the cake look like when cooked, or taste like?

Speak audibly and fluently with an increasing command of Standard English.

While demonstrated the teacher will be asking questions throughout, increasing their Standard English.

Participate in discussions, presentations, performances, role play, improvisations and debates.

You could get the children to present their cakes and have a debate/discussion on how they could change it next time. What they like and disliked about the process and the end result.

Gain, maintain and monitor the interest of the listeners.

The children will be watching and listening very closely as they will understand that they will have to do it my memory afterwards.

Consider and evaluate different viewpoints, attending to and building on the contributions of others.

Evaluate how many children liked the cooking and decorating process and how they would change it/build on the skills and knowledge in the future.

Working in a whole classroom environment or in small groups.

This recipe could be done in a whole classroom environment with 3-4 adults or in small groups of 6-8 with one adult, see below for details.

Mathematics-

- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from a given number.
- Count, read and write numbers to 100 in numerals, count multiples of twos, fives and tens.
- Given a number, identify one more or less.
- Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to , more than, less than (fewer), most, least
- Read and write numbers from 1 to 20 in numerals and words.
- Add and subtract one-digit and two-digit numbers to 20, including zero.
- Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems.
- Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

All the above will and can be taught through weighing and measuring all the ingredients.

- Fractions-recognise, find and name half as one of two equal parts of an object, shape or quantity.
- Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.

This can be taught using the beetroot. The children can cut the beetroot from a whole into $\frac{1}{2}$'s, $\frac{1}{4}$'s before grating or blending.

- Pupils should be taught, Lengths and heights, mass and weight, capacity and volume, time.

This can be demonstrated with the liquid, oil.

- Sequences events in chronological order using language for example before and after, next, first etc.

You have to add wet to dry make and then bake. The order of the ingredients to be used.

- Recognise and use language relating to dates, including days of the week, weeks, months and years.

You can use the eggs for this, see above for "the story" idea. Look at the date, how long do we have left to use it?

- Recognise and name 2-D and 3-D shapes

What is beetroot?

- Choose and use appropriate standard units to estimate and measure length/height in any direction, mass, temperature, capacity to the nearest appropriate unit, using rulers, scales, thermometer and measuring vessels.

What shall we use to weigh and measure? Measuring jugs, scales, spoons, what is the temperature of the oven, how much mixture can we fit in the tin?

- Read and write numbers up to 100 in numerals and in words.

You can ask the children to read the amounts of the ingredients placing in the cake.

- Know the number of seconds in a minute.
- Compare durations of events (for example to calculate the time taken to particular event or task)

The two above will be taught through telling the children how long the cake takes to bake, look at the clock and let the children know what time they will come out of the oven. They could estimate how long it will take.

Science-

- Asking simple questions and recognising that they can be answered in different ways.
- Observing closely, using simple equipment.

Using mixing bowls, wooden spoons what are their roles in cake making. Watching what happens to the mix when it is all added together, change in texture, colour etc.

- Performing simple tests.

Check the egg is fresh, see above for test. (Cracking it on a plate to see if the egg yolk is prominent).

- Identifying and classifying.

What is liquid and what is solid and how you can change the structure, for example blending the beetroot.

- Using their observations and ideas to suggest answers to questions.

What will happen to the mix in the oven?

- Plants, identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

Where does sugar come from, sugar cane, where does it grow and why? Where is beetroot grown and why? Rice/ Oats? Coco comes from coco bean.

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

Take this opportunity to talk to the children the where eggs come from, what came 1st the chicken or the egg?

- Identify and name a variety of common animals that re carnivores, herbivories and omnivores.

What does a chicken look like? Live and then raw.

- Describe and compare the structure of a variety of common animals.

A chicken is a living animal, it has a heart, lungs legs etc. Be careful when discussing this subject teach to their age, you might find you have a few vegetarians after teaching.

- Identify a name a variety of everyday materials m including wood, plastic, glass, metal, water and rock.

You could talk about the cake tin and the baking parchment, what are they made of? Why the tin has to be solid and the baking parchment is flexible, why?

- Observe changes across the four seasons.

If growing fruit and vegetables in school the children will have a far better understanding of the seasons and how it effects the growing and harvesting of fruit and vegetables. This is where you can talk about the beetroot, see notes above.

- Observe and describe weather associated with the seasons and how day length varies.

Talk to children about what is grown in autumn and spring and the effect the weather has on the seasons and what grows at that time.

- Explore and compare the differences between things that are living, dead, and things that have never been alive.

You can talk through the ingredients naming what was or came from a live animal. For example eggs came from a live hen and bicarbonate of soda is a man made product.

- Identify that most living things live in habitat to which they are suited and describe how different habits provide for the basic needs of different kinds of animals and plants, and how they depend on each other.

You can take the example of a chicken habitat in terms of what is a battery hen and what is a free range hen. How their habitats are different, and the effects this has on the egg. Which is better for the chicken.

- Identify and name a variety of plants and animals in their habitats, including micro-habitats

What else grows in the ground other than beetroot? Carrots, parsnips, potatoes etc. What grazes in the fields? Cows, sheep, pigs etc.

- Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.

Humans eat cows and cows eat grass.

- Observe and describe how seeds and bulbs grow into mature plants.

It would be great to grow some beetroot, sow the seed in April, May and harvest in September, October.

- Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

If your growing beetroot the children will fully understand that water is needed from the rain, light from the sun, and the warm of the spring, summer months.

- Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)

See above.

- Describe the importance for humans of exercise, the right amounts of different types of food and hygiene.

This could be included in while talking about the battery and free range and how movement effects the food.

- Find out how the shapes of solid objects made from some materials can be changes by squashing, bending, twisting and strengthening.

This will be highlighted when the beetroot is being blended or grated. Also how the eggs strengthen the cake to stay risen.

Art and design-

- To use a range of material creatively to design and make products.

This will happen in every practical cooking lesson.

- To use drawing, painting and sculpture to develop and share their ideas, experiences and imagination.

Before cooking you could paint, draw or sculpture what they will be cooking.

Discussion why they chose the make what they did.

- To develop a wide range of art and design techniques in using colour, pattern, texture, line, shape, form and space.

This will happen in every practical cooking lesson.

- About the work of a range of artist, craft makers and designers, describing the differences and similarities between different practices a disciplines, and making links to their own work.

Don't forget cooking is a culinary art form, the children could look at some cooking books for inspiration, ideas, some of the greats, idols of the cooking world.

Design and Technology-

- Design purposeful, functional, appealing products for themselves and other users based on design criteria.

This will happen in every practical cooking lesson.

- Generate, develop, model and communicate their ideas through talking, drawing, templates, mock ups and where appropriate, information and communication technology.

This will happen in every practical cooking lesson.

- Select from and use a range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing)

This will happen in every practical cooking lesson.

- Select from a wide range of material and components, including construction materials, textiles and ingredients, according to their characteristics.

This will happen in every practical cooking lesson.

- Explore and evaluate a range of existing products.

If there is a similar product on the market you could buy it and compare it to what the children have made. Nutritional and cost wise.

- Evaluate their ideas and products against design criteria's.

This will happen after every practical cooking lesson.

- Build structures, exploring how they can be made stronger, stiffer and more stable.

What makes the cake and gives it its structure? What keeps it together? What makes it rise and hold? See notes above.

Cooking and nutrition-

- Use the basic principles of a healthy and varied diet to prepare dishes.

See notes above

- Understand where food comes from.

See notes above.

- Understand and apply the principles of a healthy diet and varied diet.

See notes above.

- Prepare and cook a variety of predominantly savoury dishes using a range of cooking techniques.

Even though this is a sweet cake it contains a vegetable.

- Understand seasonality, and know where and how a variety of ingredients are grown, reared, caught and processed.

See notes above.

Geography-

- Name and locate the world's seven continents and 5 oceans.

When talking about the rice flour, you will be talking about Asian.

- Understand geographical similarities and differences through studying the human and physical geography of a small area of the United Kingdom, and of a small area in a contrasting non-European country.

You could also talk about what things grow in the same countries and why?

- Identity seasonal and daily weather patterns in the UK and the location of hot and cold areas of the world in relation to the Equator and the north and south poles

See notes above.

- Use physical features, including beach, cliff, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather.

Beetroot grows in soil, sugar is grown on flat land, and almonds grow on trees.

- Key human features including city, town, village, factory, farm, house, office, port, harbour and shop.

Try and visit a farm with the children so they can see, smell and hear the difference.

- Physical including climate zones, biomes and vegetation belts, rivers, mountains, volcanos and earthquakes, and the water cycle.

See notes above.

- Human including types of settlements and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water.

A good opportunity to talk about the production of food and how that effect the price, air miles, fair trade, sustainability.

History

- Stone and Iron Age, Roman Empire, Anglo-Saxons and scots, Viking, Edward the confessor, local history study, ancient Greece.

Beetroot was eaten in the 19th century by the Romans and cultivated grew when they discovered it could be made into sugar.

Almonds grow in Greece.

Skills the children will be taught through making this recipe.

1. Weighing and measuring using spoons and cups, measuring liquids (oil), using balance and digital scales. All ingredients
2. Using a sharp knife. To cut the beetroot into ¼'s.
3. Grating soft foods. Grating of the beetroot.
4. Cracking eggs.
5. Beating eggs.
6. Adding liquid to flour.
7. All in one cake mixing.
8. Scraping out a bowl with a spatula.
9. Grease and lining a cake tin.
10. Dividing mixture into tins.
11. Beating ingredients together.
12. Decorating.

Progression of skills/how the recipe could change for key stage 2 and 3.

1. Key stage 3 children can take charge of the blender/food processor and oven under supervision.

The Recipe

BEETROOT & CHOCOLATE CAKE - NUT FREE

Make a super fast and easy beetroot and chocolate cake."

Cooked beetroot moistens the cake crumb and adds earthy sweetness to the bitter cocoa powder. Makes one 24cm cake, or two 12cm cakes

Ingredients

- 200ml vegetable oil, plus extra for greasing
- 100g rice flour
- 100g rolled fine or medium oats - ***(blended to a coarse flour)***
- 1 tsp bicarbonate of soda
- 75g cocoa powder
- 250g caster sugar
- 250g cooked and peeled beetroot (about 4 small ones)
- 3 eggs (or use 2 large eggs)

Method;

1. Preheat the oven to 180°C/gas mark 4. Grease and line a 20cm round cake tin with baking parchment.
2. Mix the rice flour, ground oats, bicarbonate of soda, cocoa powder and sugar in a large bowl.
3. Blend the beetroot in a food processor or blender, then add the eggs one at a time, whizzing between each addition.
4. Pour in the oil and process until smooth.
5. Add the beetroot mixture to the dry ingredients and mix to combine.
6. Pour into the prepared tin and bake for about 40 minutes, or until a skewer inserted into the centre of the cake comes out clean and the cake is firm to touch.
7. Cool in the tin for 5 minutes, then remove from the tin and place on a wire rack to cool completely.

