

**The
Scholars
Programme**



The Chemistry of the Cupcake

Key Stage 2 Programme

Pupil Name

Tutorial
Group

Coursebook
Designed by



Course Rationale

We are all familiar with cupcakes – in the supermarket, at birthday parties, at bake sales, even made at home. But how exactly is a cupcake made? What are the chemical reactions that happen within the cupcake batter? And how does the batter change in the oven?

In this course, you will look at the different components of a cupcake and how they behave to make the cupcake. As you progress through the course, you will learn about new topics and have the chance to strengthen your critical thinking, communication and problem solving skills. To finish the course off, you will write a 1,000 word essay on the science behind your favourite cupcake.

Front Cover Image: <https://www.hungry-girl.com/recipe-makeovers/low-calorie-frosted-gingerbread-cupcakes-recipe>

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Sample Tutorial Activity



What ingredients go into a simple cupcake?

Objective 1: To find out what's in a cupcake

Vanilla cupcakes

Makes 10

For the sponge:

- 110 g butter
- 110 g caster sugar
- 2 large eggs
- 1 teaspoon vanilla essence
- 110 g plain flour
- 1 teaspoon baking powder

For the icing:

- 140 g butter
- 300 g icing sugar
- 1 tablespoon milk
- Few drops of vanilla essence

What other ingredients might you use for different flavour cupcakes?

To which food groups do the main ingredients belong?

Butter



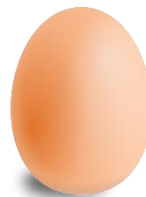
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Sugar



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Eggs



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Flour



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How do the ingredients come together to make a cupcake?

Objective 2: To understand the role of each ingredient

Method

For the cupcake sponge:

1. Preheat the oven to 180°C
2. Cream the butter and sugar together in a bowl until pale
3. Beat in the eggs one at a time
4. Stir in the vanilla extract
5. Fold the flour and the baking powder into the mixture
6. Spoon the mixture into paper cases and bake in the oven for 10-12 minutes. The cupcakes should be golden-brown on top.

For the icing:

1. Beat the butter and the icing sugar together until smooth
2. Add the milk and stir until the mixture is smooth
3. Mix in the food colouring

Which ingredient performs which role in making the cupcake sponge?

Builds the light, stable structure of the sponge and holds the other ingredients together

Makes the sponge soft and moist

Makes the sponge taste sweet and appear golden-brown when baked

Gives the sponge a vanilla flavour

Helps to build the structure of the cake and acts as an emulsifier

Acts as a leavening agent
