

The formula that finds the right tights for ANY weather

OCTOBER is here and it's that dread time of the year when we begin the transition from the bare legs of summer to wearing tights or stockings to cover up for autumn.

But working out whether you should be warding off the chill with a thick 80 denier pair, or if it will be a balmy day that needs nothing more warming than 20 denier, can be something of an art form.

At least it was until a mathematician decided to make it a science, by developing a formula that tells you exactly what thickness of stocking you should be wearing based on both

by Claire Coleman

the predicted temperature and the wind speed. 'It started when BBC Radio Nottinghamshire asked me if I could come up with a tights forecasting equation to help listeners get dressed in the mornings,' says Dr James Hind, a lecturer in statistics at Nottingham Trent University. 'I began by asking my wife what denier tights she was wearing each day and keeping a note of the temperatures.'

When he plotted the points on a graph, with temperature along the bottom and the denier of tights up the side, he ended up with a left-to-right curve shaped like a ski slope. This is because when the temperature is anything from minus 10c to zero, you want to wear the thickest tights possible and, conversely, when it's anything above about 20c, you probably don't want to be wearing tights at all. It's only between about zero and 20c that there's going to be a significant change.

Dr Hind realised the formula needed to work with negative numbers, and also had to take the wind-chill factor into consideration because a windy day will feel a lot colder than one that's calm.

'There is already a mathematical equation that describes a curve similar to the one I saw when I plotted the points on my graph,' he explains. To make it work for the tights problem, Dr Hind first had to decide what thickness he wanted his tights to go from and to.

'Years ago, I played the part of Robin Hood at a Nottingham tourist attraction, so I've worn tights myself and I knew that even on the coldest days, a pair of 110 denier normally kept the chill out,' he says.

He decided to adjust the formula so the results would go from 0 to 110 denier. He then added in a few things to make the numbers scale to a manageable size. And, to account for the fact that a northerly wind is colder than a southerly wind, he decided northerly wind speeds should use the speed in kilometres per hour (which will always be a bigger number than the speed in mph), but that a southerly wind should be in miles per hour.

The formula he came up with is — wait for it:

$$D = 110 - \left(\frac{110}{1 + e^{\frac{\sqrt{w-t}}{2\pi}}} \right)$$

This is where D is the denier of tights required, w is the wind speed and t is the temperature. (For the mathematical sticklers among you, $\sqrt{\quad}$ is a symbol that means you should find the square



by Sarah Rainey

WATCHING The Great British Bake Off week after week, it is hard not to feel intimidated by its spectacular creations.

Pastry horns filled with clouds of whipped cream, desserts that defy gravity — it's enough to make even the most experienced home-baker feel like a flop.

But what if you could bake show-stopping cakes using nothing but a simple mixture made in one bowl? Behold the 'magic cake' as perfected in a new recipe book. Made with egg yolks, sugar, flour, butter, milk and whipped egg whites, the batter splits into three mixtures in the oven, which bake in three layers, each different in colour, texture and taste.

At the bottom is a dense, moist base, more like pastry than cake; in the middle is a layer of cream; and on top, an airy genoise sponge.

So how does it work? Unlike ordinary cakes, a magic cake is around 50 per cent liquid, so the separation is down to density. The heavier ingredients (egg yolks and milk) sink to the bottom of the tin, while the lighter ones (egg whites) rise to the top. Both parts of the egg blend with other ingredients of a similar density to form each cake layer.

The next trick is a chemical process called coagulation, which thickens the cake — but it needs heat to occur. As the cooking temperature for magic cakes is just 150c, compared to 180c for most conventional cakes, the division of layers happens before coagulation can take place.

The cake batter at the bottom cooks at a lower heat than the other two layers and solidifies first. The sponge crust bakes next, followed by the cream, which takes almost an hour to firm up.

The cakes are said to be so delicious that Nigella Lawson has requested a copy of the new book to try them out for herself.

So are they really as magical as they sound? Or is it all just an illusion? I tested five recipes from the book to find out...

TECHNICAL CHALLENGE

VANILLA CAKE: This is the original magic cake — a plain sponge flavoured with vanilla.

METHOD: Whisk egg yolks with sugar until the mixture whitens, then add melted butter and flour. Next, split a vanilla pod with a sharp knife, and scrape the seeds into a saucepan of milk to infuse over a low heat.

It's fiddly work and I'm tempted to use liquid vanilla extract, but stick to the recipe.

An hour later, I pour the infused milk into the batter, mixing furiously to combine. I then whisk the egg whites and fold in gently.

What's left is an unappetising, lumpy mixture. It looks more like a bowl of scrambled eggs. Undeterred — the book warns that 'large lumps should remain' as this helps separation — I pour it into a 9.5in tin.

It needs 50 minutes at 150c, then an hour to cool before turning it out on to a plate.

LOOKS: When I slice into the cake, the three layers are beautifully distinct, with the vanilla seeds dotting the top sponge only (they're the lightest ingredient).

The genoise is very pale, peppered with tiny holes; the cream is pure white; the base is sunshine yellow and dense like a cheesecake.

TASTE: The recipe suggests serving this cold after a few hours in the fridge, to allow the layers to set properly. It is a sensation!

First, the base is silky smooth and deliciously mellow; then, in the middle, a dollop of indulgent cream; and finally, on top, a buttery, melt-in-the-mouth sponge with just the right amount of crunch.

SORCERY SCORE: A trick to keep up your sleeve when Mary Berry comes to tea. **5/5**

TEATIME TREAT

COFFEE CAKE: More like a traybake than a cake, this is best served upside-down with the crispy bit on the bottom like a shortbread base and an aromatic coffee top.

METHOD: Instead of infusing the milk with vanilla, this calls for instant coffee granules, so I heat up what looks like a frothy latte.

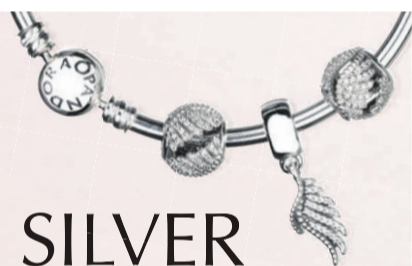
As that cools, I make the basic sponge mixture — beating egg yolks with sugar, melted butter and flour. Then I add the coffee mixture, whip up the whites and fold these in as before.

This one doesn't look as lumpy as the vanilla batter, and I worry that I've over-whisked the eggs. I pour it into an 8in square tin. It takes 45 minutes at 150c, plus two hours' cooling time.

LOOKS: The layers are really clear — dark brown on top, caramel in the middle, and a rough-textured, pale base.

But tiny bubbles have burst through the top, making it bumpy and uneven. I blame the extra air in the egg whites. I try to disguise it by drizzling melted chocolate over the top.

TASTE: The coffee isn't intense enough to give much of a flavour (the recipe only calls for 30g), so it tastes a bit bland. The texture



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Kate effect

Sales of opaque black tights — a Duchess of Cambridge favourite — were 112 per cent higher in January than a year earlier

It's a jam-packed autumn

THE jam-making season is upon us, with lots of luscious blackberries, plums and redcurrants still in season and ready to be made into the perfect treat.

If you're looking to create a sweet present or wedding favour, put your jams into pretty decorative jars from website waresofknutsford.co.uk. And if

you aren't the culinary type, you can cheat with Lakeland's Prepared Preserving Fruit (from £2.58 for 850g, lakeland.co.uk).

Simply pop the pre-chopped fruit into a pan on the hob, add water and sugar and in just 30 minutes you'll have lashings of delicious homemade jam.

