

The n kg chicken

Tony Cotton

I was visiting a secondary school in Nottingham to observe one of my students. As I glanced round the room one student seemed detached from the rest of the group – literally (she was sitting on her own at the back) and through a lack of engagement with what the rest of the class were doing. So I sat next to her; we'll call her Simone.

She engaged with me immediately: "I'm not supposed to be in this group – I've been sent down here for messing about."

She was working her way through a booklet that the rest of her peers in her 'normal' group were following, so I asked her what she was doing. "It's stupid – look, I've got to work out how long to cook a chicken that weighs n kg. What's a chicken that weighs n kg?"

I looked at the page – it told us that we had to cook chickens for 20 minutes per kg + 20 minutes.

So I asked Simone, "How long would you have to cook a 3 kg chicken for?" Simone looked at me frustrated, tutted very loudly and the following conversation ensued:

Simone "It isn't a 3 kg chicken – it's an n kg chicken!"

Tony "But say it was 3 kg; how long would you cook it for?"

Simone "Well that's easy – 1 hour 20 minutes."

Tony "OK – and how long would you cook a 5 kg chicken for?"

Simone (*increasingly frustrated*) "It isn't a 5

kg chicken – it's an n kg chicken!"
Tony (*trying to remain calm, aware of irritated glances from the rest of the class*) No – but say it was 5kg.

Simone (*very quickly*) 2 hours.

Tony So how are you working it out?

Simone You just add up the 20 minutes for each kg and then add on an extra one.

Tony So how many 20s for 3 kg?

Simone 3 and another one.

Tony And for 5?

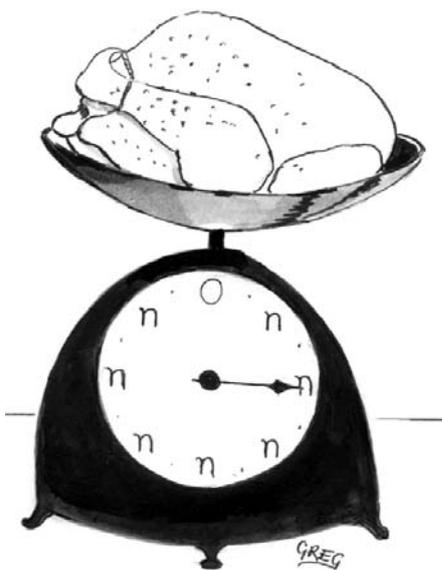
Simone 5 and another one.

Tony (*writing*) So if I wrote n lots of 20 and another 20 like this: $n \times 20 + 20$, what does that mean?

Simone Well I suppose that's the answer – but there isn't such a thing as an n kg chicken.

I left later wondering how often we give tasks to mathematics learners that they can already do but the task somehow manages to convince them that maths is hard and confusing and worst of all doesn't make any sense in their real world. So thanks, Simone, for teaching me that there is no such thing as an n kg chicken.

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My accidental parabola

Colin Foster

I was working with my Y8 class this week on straight line graphs. I was asking pupils to invent examples of equations that would give straight line graphs and say how they would look. To check, I was entering them into a graph-plotting program so we could see on the screen if they were right. To be honest it was getting a little dull.

Then as I tried to type $y = x$ I accidentally bumped the x key again and got $y = xx$ and before I'd noticed I'd pressed enter and a parabola appeared on the screen. Suddenly everyone woke up! I said something like "Oops, made a mistake there" and quickly deleted the

second x and pressed enter again, but it was too late.

"What happened *there*!?" someone asked. And then there were more questions, of the "What if you put xxx ?" kind and I found myself saying, "This is really supposed to be a lesson on straight line graphs". But I couldn't ignore the mathematical questions that were being asked or the energy that had been produced by my slip.

The incident reminded me of the power of a surprise. A lesson where everything is kept well-ordered with well-defined preordained learning objectives ('one idea per lesson') can be stulti-

fyng. A lesson where nothing ever proceeds except by small incremental steps is very likely to be boring.

Postscript

I don't think I'd recently thought of $y = x^2$ as $y = xx$. The pupils had worked out by now that 'the number in front of x is the gradient' and they could see for this equation that that number wasn't a constant but was x . So as x increases, the 'number in front of x ' (which is x) also increases. So the gradient increases as x increases and that's what makes the graph curve upwards. But actually I know from calculus that the gradient isn't x but $2x$, and it took me a bit of thought to realise why that is.

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