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Understanding uncertainty: The Premier League

This is the second part of our new column on risk and uncertainty. **David Spiegelhalter**, Winton Professor for the Public Understanding of Risk at the University of Cambridge, continues examining league tables using the Premier League as an example. Find out just how much or how little these simple rankings can tell you.

Maths and climate change: the melting Arctic

The Arctic ice cap is melting fast and the consequences are grim. Mathematical modelling is key to predicting how much longer the ice will be around and assessing the impact of an ice free Arctic on the rest of the planet. *Plus* spoke to **Peter Wadhams** from the Polar Ocean Physics Group at the University of Cambridge to get a glimpse of the group's work.

Reconstructing the tree of life

Next year is a great one for biology. Not only will we celebrate 150 years since the publication of *On the origin of species*, but also 200 years since the birth of its author, Charles Darwin. At the heart of Darwin's theory of evolution lies a beautifully simple mathematical object: the evolutionary tree. In this article we look at how maths is used to reconstruct and understand it.

Matrix: Simulating the world
Part II: cellular automata
Lewis Dartnell turns the universe into a matrix to model traffic, forest fires and sprawling cities.

Natural selection, maths and milk
According to Darwin, natural selection is the driving force of evolution. It's a beautifully simple idea, but given the thousands of years that are involved, nobody has ever seen it in action. So how can we tell whether or not natural selection occurs and which of our traits are a result of it? In this article **Charlotte Mulcare** uses milk to show how maths and stats can provide genetic answers.

What do you think you're worth?
Bonuses are a fact of business life. Last year the Guardian newspaper calculated that the cash rewards paid to London's financial chiefs comfortably outstripped the UK's entire transport budget. With such large sums at stake, envy is bound to raise its ugly head, nver a good thing for company morale. So how should you decide who gets how much? Steven J. Brams suggests a method that's not only fair, but also encourages honesty.

Career interview: Financial Engineer
Rupa Patel never wanted to be a financial engineer she wanted to be a maths teacher. However, her skills in conveying difficult mathematical concepts to others, as well as a love of maths, enticed her into the exciting field of financial mathematics. Now she models risk, travels Europe and occasionally finds time to herself to examine the maths of her job in detail.

Teacher package: Statistics and probability theory
This issue's teacher package brings together all *Plus* articles on probability and statistics, exploring anything from maths in the dock to games of chance. It also has some handy links to related problems on our sister site NRICH.

Plus is part of the family of activities in the Millennium Mathematics Project, which also includes the NRICH and MOTIVATE sites.