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Science Today

PAH O'DONOGHUE



It's time we asked for the evidence

A UK campaign is encouraging people to ask for evidence of claims about science and medicine - should we not join in?

HE Enlightenment is under threat. So is reason. So is truth. So is relence. I arm one of those scientists who feel that it is no longer enough justs to get on and do science. We have to decorde a significant proportion of eart time and resources to defending it from deliberate attack from generating and memory.

organised ignorance."
This delightful quote constitutes a typically trenchant call to arms by Richard Dawkins. In an environment in which we must do our Sense About Science (senseaboutscience org), humched in new campaign entitled Ask for Evidence. The campaign has received support from high-profile figures including David Attenborough, Richard Dauklins, Derren Brown, Dara O Brisin and Simon Singh.

rown, Dara O Brum and Smon Singh.

Ask for Endence encourages people to smand evidence for claims about science and and misleading statements are abundant in advertising, the media and in a wide range of organisations and institutions – even within scientific professions. I would encourage

everyone with an interest in the promotio good science to think of ways in which to engage with this landable project. Teachers might devise interesting and entertaining challenges for schoolchildren

odless topics for projects. You will undoubtedly find Hopi ear candles on sale. These are placed in the ear and lit and are said to draw out toxins and to strengthen

candle. Other

people there who claim to be able to predict UFOs over maps

There will be

ine canoie is stood lighting on a saucer and the chimney effect can be countered by placing light material (a piece of tissue will do) beneath the candle and noting that it does not rise. They might also note the medical literature that documents the burns that can ensue.

Another Blody exhibit will be mounted by teams of iridologists who claim to be able to note signs of impending disease through markings in the iris. Following treatment with

herbal or homoopathic products, they claim to see changes in the iris that indicate that the treatment has been effective. Children can learn about the eye and that the iris does not change except in cases of rare ocular confitto detect disease by holding crystals suspen

It may be invisible, but mathematics plays a crucial role in everything we do - from booking flights to solving crimes, writes John Holden

How numbers rock our world

modern technological society is based on maths - and practical applications are being used by appreciations are come joses by their mathematics in a variety in the mathematics in a variety in the mathematics all around use? You just have to look all little but closer. Mathe Week leeland licks off tenserow. New in its sinds year, a sians to permote the subject at primary and pool syrinary level and desineatrones just how much of excepting life is driven by mathe. A notice endormous indeed, but the event has a lest way to go it terms of making any real differential properties of making any real differential properties.

moths' prominence in everything we do, the world still appears in terms that shy away from all things numerical for most people. "Maths in everyday life goes beyond just using arithmetic in a

vider, all require mothematics

you d find the increditty difficult if it wasn't there."

The modern search engine is one big mathematical algorithm too. The reason why Google is the biggest search engine in the world is because two mathematicians came up with the most efficient algorithm for online searching. "Online ticket sales for compu-

our flight-browsing habits and waiting for that indecisive moment where we choose to re-examine our decision later, only to find he has doubled the price while our backs are turned.

In fact there are mathematical programmes choosing flight costs. in online airline sales and draws on several areas of maths - princi-pally probability and statistics, graph theory and linear algebra,"

says Nolan.

UCD professor of meteorology
Peter Lynch has lived and worked
through the transition in weather maths equations. Our model of e atmosphere is based on equa-

tions too.
"It's enormously more reliable than the educated guesswork we used in the past," he says. "We can now make objective measure-ments. Three- to five-day forecasts



You don't need to see it or know how it works. But you'd find life incredibly

noted several days about " Metoor-

ench. An area that is currently An area that is currently driving the Irish economic recovery is that of biomechanics and the bio-medical industry. While a relatively new scientific area, hiemechanics, is dependent on the work done by mathemati-cians in the background. "It's cer-tainty on the rise in applied maths," says Nolan. "Bromemaths," says Nolan. "Blome-chanics takes the same kinds of ideas and similar equations used in weather forecasting and theo-

difficult if it wasn't there biological systems in the study of things like human blood flow." The Mathematics Applications Consortium for Science and Industry (Macsi) is based in the

"One analog devices company is looking into the design of mobile phone handsets." says prof Brian Glees or of Maesi, "We also have a

Prof Gleeson, who is a researcher at UL, recently invented a new mathematical techthe outcome of dynamic changes on large-scale networks. "This new technique will pro-

side a now-execution production of software range of prouding place software range of prouding place posterior seeds as epidemics, com-puter visues and social media rende, 'be says. 'It's about notworks and con-nections between positive be they social networks like Facebook, or human contact networks like met-populum aiprovis. The way htmsy spread like disease, rumeurs and the adoption of now technologies. 'Authorities and the seed of the pro-ting of the properties of the pro-teed of the pro-ber and the pro-teed of the pro-ber and the pro-ber and the pro-teed of the protein pro-teed of the protein pro-teed of the protein pro-teed of the pro-teed o ide a more accurate prediction of

example, take information like the example, take information like the average number of friends someone has on Facobook and use that information to tell us how quickly a disease might spread among a group? The mathema-ical models used for both are in fact very similar. Maths is all about spotting patterns." The modern search engine is one big mathematical algorithm too. The reason why Google is the biggest search engine in the world is because two mathematicians came up with the most efficient algorithm for ordine searching. algorithm for online searching Photograph: Thinkstock The maths of stabbing

STABBING ASSAULTS

engineers at UCD, NUI Galv and the University of Lyon, France, have been trying to help the State Pathologist's

in legal trials the state pathologist will often be asleed what was the degree force involved in a stabbing. mathematics at NUI Galway. Michel Destrade. "But they can only give a vague answe like 'mid', 'moderate' or 'severs." So the Pathologist' Office turned to Irish scientis to conduct experiments to help quantify that degree of in France to see if there wen numerical patterns to stabbling," asys Destrade. This has led to a PhO Into the area funded by the State Pathologist's Office and the Irish Research Council. Science Engineering and Technology (RCSET), which is now in its third were "Victorial and the stable and the Irish Research Council Science Engineering and Technology (RCSET), which is now in its third were "Victorial and Irish Iris

modes that we can then implement within a simulatio programme. We published or first results in one of the world's leading forensics journals (Forensic Science) journals (Forensis Science international). Surprisingly, we found that two knives of the same type produce puncture at widely different amounts of force, even after all veriable parameters are controlled (such as speed, angle, tension and nature of

explain why no proper scale exists for stabbing forces." Computer-generated simulations would be of great

reconstructing an incident as accurately as possible. It could make a big difference in a legal trial. If, for example, the accused claims assess the veracity of this claim through a simulation. "It raises important questions around the whole area of intent," says Destrade.

