重建对科学的信任 Restore trust in science

Hello. This is 6 Minute English from BBC Learning English. I'm Sam. And I'm Rob.

大家好。这里是 BBC 学习英语栏目的六分钟英语。我是萨姆。我是罗布。

Once in a while along comes a scientist who captures the public imagination, and communicates their passion for science in an exciting and understandable way.

偶尔会出现这样一位科学家：他能激发公众的想象力，深入浅出地表达自己对科学的热爱，受到观众追捧。

In this programme, we'll be meeting one of America's best-known popular scientists.

在本期节目中，我们将认识一位美国最著名的科学家。

Astronomer Neil deGrasse Tyson.

天文学家奈尔·德葛拉司·泰森。

He's a man with a gift for communicating and inspiring people with his television shows and books on cosmology, the study of the origin and nature of the universe.

他很有天赋，制作了有关宇宙学的电视节目，出版了有关书籍，来科普知识、激励公众。宇宙学是研究宇宙起源和本质的学科。

In his day job he runs the Hayden Planetarium in New York's American Museum of Natural History, but Neil's real mission is to encourage scientific thinking among the American public.

他的日常工作是担任纽约美国自然史博物馆海顿天象馆的馆长，但奈尔真正的使命是鼓励美国公众进行科学思考。

We'll be hearing from the famous astronomer, and learning some new vocabulary, soon.

我们很快就要听到这位著名天文学家的见解，并学习一些新的词汇。

But first I have a question for you, Sam.

但首先我有个问题要问你，萨姆。

Science is ever-changing with new discoveries updating our understanding all the time.

科学是不断发展的，新的发现时刻更新着人类的知识库。

For centuries, the Earth was thought to be the centre of the Universe, but who was the first astronomer to have the correct idea that, in fact, the Earth and the planets revolve around the Sun?

几个世纪以来，地球一直被认为是宇宙的中心，但谁是第一个正确地认识到地球和其他行星都绕着太阳转的天文学家呢?

Was it a) Nicolaus Copernicus b) Isaac Newton, or c) Galileo Galilei?

是 a) 尼古拉·哥白尼 b) 艾萨克·牛顿，还是 c) 伽利略?

添加的词汇

Hmm, I'll say it was c) Galileo.

嗯，我觉得是伽利略。

OK, Sam. I'll reveal the correct answer later in the programme.

好的，山姆。稍后我将在节目中揭晓正确答案。

Recent events like the Covid pandemic and climate crisis, have put scientists under pressure from critics motivated by political views.

最近的疫情和气候危机等事件让科学家们面临不小的压力。有人出于政治考量批评他们。

Neil deGrasse Tyson thinks facts are not dependent on politics, but should be established with the scientific method, a process of finding the truth through testing and experimentation.

奈尔·德葛拉司·泰森认为，事实不随政治事件变动，事实应该用科学的方法来确立。科学方法是通过测试和实验找到真理的过程。

Here's Neil explaining more about the scientific method to BBC World Service programme, HardTalk.

以下是奈尔在BBC世界服务栏目《畅所欲言》上对科学方法的进一步解释。

If you have a brilliant idea and you test it and it unearths so much of what has been known before, we're gonna double-check that – the rest of us – we'll say, 'But did he do it?

如果你有一个绝妙的想法，你对它进行了实验，发现了很多以前已经知道的东西，我们其他人会仔细检查这个实验。我们会问，“他真的做到了吗？”

Did he cross his t's and dot his i's?

他有没有关注到所有细节?

Did he ... Let me check the power that's driving his experiment, you know, the wall current, let me check how that was conceived and done'.

他有...吗？让我检查一下他实验的动力，比如壁电流，让我检查一下他是如何构思和完成实验的。

And if no-one can duplicate your results, it's not a result.

如果没有人能复刻你的实验结果，那它就不是个结果。

Before scientists can confirm the truth of an experiment, their findings must be doubled-checked, making certain something is correct by carefully examining it again.

在科学家们确认一项实验结果成立之前，他们的实验结果必须被仔细检查，即再次仔细检查来确保某事是正确的。

This process is called 'peer review', other scientists double-checking the experiment to make sure everything was done correctly.

这一过程被称为“同行评审”，即其他科学家对实验进行复核，以确保实验结果正确无误。

One way they do this is to duplicate, or repeat, the experiment to see if they get the same result.

复核的一种方法是重复实验，看看能否得到相同的结果。

In other words, Neil wants scientists to have crossed the t's and dotted the i's, a phrase which means paying attention to the small details of whatever you are doing.

换句话说，奈尔希望科学家们已经给所有t都划上一横，给所有i加了点，即事无巨细都关注到。

A scientific approach requires an open mind and critical thinking, but Neil believes the most important thing is to know the difference between fact and opinion.

科学的验证方法需要开放的思维和批判性思维，但奈尔认为，最重要的是分清事实和观点。

People have opinions about all kinds of things but that doesn't make what they believe a fact.

人们对各种各样的事情都有看法，但这并不能使他们相信的事情成为事实。

Yet fact and opinion are becoming harder to separate.

然而，事实和观点正变得越来越难以分辨。

As protests by anti-vaccine groups and climate change deniers have shown, many Americans, even presidents, seem suspicious of scientific fact.

正如反疫苗团体和气候变化否认者的抗议所表明的那样，许多美国人，甚至是总统，似乎对科学事实持怀疑态度。

It's a worrying trend that Neil thinks is a result of the US education system, as he told BBC World Service programme, HardTalk.

这个趋势令人担忧。奈尔认为，这是美国教育体系导致的。他在BBC世界服务栏目的《畅所欲言》上也是这样说的。

It has to do with how science is taught in schools.

这与学校教授科学的方式有关。

It's currently taught as a body of information, a satchel of facts that are imparted upon you and then you regurgitate that for an exam.

目前学校把科学作为一个信息板块来教授，教给学生一堆事实，然后学生为了考试死记硬背。

That's an aspect of science, but it's not the most important part of science.

这是科学的一个方面，但不是科学最重要的部分。

The most important part of science is knowing how to question things and knowing when an answer has emerged that represents an objective truth about this world.

科学最重要的部分是知道如何质疑事物，知道什么研究结果才是客观真理。

Neil says that science is taught by encouraging students regurgitate facts, to repeat information without properly understanding it.

奈尔说，学校教授科学的方法是让学生死记硬背，即在没有正确理解的情况下重复知识。

Knowledge is important, but what's also needed is a questioning attitude that can recognise objective truth, a truth about the natural world which is not influenced by human bias, opinions or emotion.

知识很重要，但科学还需要质疑精神，和一双明辨客观真理的眼睛。客观真理是一种关于自然世界的真理，不受人类偏见、观点和情感的影响。

Without that, anyone is free to call whatever they like a 'fact', which only leads to chaos.

没有了客观真理，任何人都可以把自己喜欢的东西称为“事实”。这只会导致混乱。

Right.

正确的。

No matter how hard I believe that the Moon is made of cheese, or the Sun goes round around the Earth, believing it doesn't make it true.

无论我多么坚定地相信月球是奶酪做的，或者太阳绕着地球转。相信不能使之成为事实。

That sounds like something Neil deGrasse Tyson would agree with – and maybe Galileo too!

奈尔·德葛拉司·泰森应该会认同这个说法，也许伽利略也认同！

Yes. In my question I asked who first came up with the idea that the Earth revolves around the Sun.

对了。我问过你，是谁最先提出地球绕太阳转的想法。

And I said it was Renaissance astronomer, Galileo.

我说是文艺复兴时期的天文学家伽利略。

Which was the wrong answer, I'm afraid.

你恐怕打错了。

Galileo knew the Earth revolved around the Sun, but the first person with the idea was Polish astronomer, Nicolaus Copernicus, in 1543, unfortunately, centuries before the invention of television could spread the news of this objective truth, a provable truth which is uninfluenced by human bias or opinion.

伽利略知道地球绕着太阳转，但第一个提出这一想法的是波兰天文学家尼古拉·哥白尼。1543年他提出了这个想法，但不幸的是，那时距电视被发明还有几个世纪，这一客观真理无法快速传播。客观真理是不受人类偏见或观点影响的可证明的真理。

OK, let's recap the rest of the vocabulary from our chat about American scientist Neil deGrasse Tyson and his love of cosmology - the study of the Universe.

好了，让我们回顾一下本期词汇。本期讨论了美国科学家奈尔·德葛拉司·泰森和他对宇宙学——研究宇宙的学科——的热爱。

To double-check something means to make certain it's correct by carefully re-examining it.

“double-check”的意思是再次仔细检查某事来确保它是正确的。

One way scientists do this is to duplicate, or repeat exactly, an experiment.

科学家复查的一种方法是复刻实验，即原原本本地重复一项实验。

The idiom 'cross the t's and dot the i's' means to pay close attention to the details of what you are doing.

俚语“cross the t's and dot the i's”的意思是密切关注所做的事情的细节。

And finally, if you regurgitate facts, you just repeat them without properly understanding them, something a true scientist would never do!

最后，“regurgitate”是指没有真正理解就一味重复某事一个真正的科学家永远不会这样做！

Once again, our six minutes are up.

我们的六分钟又到了。

Goodbye for now! Bye!

再见了，现在！再见！