冰与生命起源 Ice and the origins of life on Earth

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

你好。这里是BBC英语六分钟。我是山姆。我是尼尔。

Have you ever made a snowman or enjoyed a cold drink on a hot summer's day?

你有没有在炎热的夏天堆过雪人或者喝过冷饮?

Slippery in winter and cooling in summer, ice is made when water gets so cold it freezes.

冬天滑，夏天凉，当水冷到冻结时，冰就形成了。

But there's much more to ice than skiing holidays and cold drinks.

但除了滑雪度假和冷饮，还有更多关于冰的东西。

Yes, in an exciting discovery, the James Webb Space Telescope recently detected the coldest ices ever in outer space, something NASA scientists think could explain the origins of life on Earth.

是的，在一个令人兴奋的发现中，詹姆斯·韦伯太空望远镜最近发现了外太空有史以来最冷的冰，美国宇航局的科学家认为这可以解释地球上生命的起源。

For years scientists have debated how life started on our planet.

多年来，科学家们一直在争论生命是如何在地球上起源的。

Billions of years ago, long before the dinosaurs, animals or even plants existed, the Earth had a watery environment of oxygen-free gases and chemicals known as the primordial soup.

数十亿年前，远在恐龙、动物甚至植物出现之前，地球上有一个由无氧气体和化学物质组成的水环境，即所谓的“原始汤”。

It had the potential for life to develop, but something was missing.

它有孕育生命的潜力，但是缺少了一些东西。

So how did we jump from the primordial soup to the first living plants, animals, and eventually humans?

那么，我们是如何从原始汤跃升到最早的植物、动物，最终成为人类的呢?

And how does ice fit into the story?

冰又是如何融入这个故事的呢?

That's what we'll be finding out in this programme, and as usual, we'll be learning some useful new vocabulary as well.

这就是我们在本期节目中要发现的，和往常一样，我们也会学习一些有用的新词汇。

But first I have a question for you, Neil.

但首先我有个问题要问你，尼尔。

添加的词汇

We know ice is frozen water, but do you know the chemical symbol for water?

我们知道冰是冻结的水，但你知道水的化学符号吗?

Is it: a) H2O ? b) HO2 ? or, c) H2O2 ?

是a) H2O ? b) HO2 ? 还是c) H2O2 ?

Well, I really hope I get this right. I think the answer is H2O.

我希望自己说对了。我认为答案是H2O。

OK, we'll find out or check if you're right later in the programme.

好的，稍后我们再看你的回答是否正确。

Astronomer, Professor Melissa McClure, worked with the NASA scientists who found ice on Europa, one of Jupiter's moons.

天文学家梅丽莎·麦克卢尔教授与美国宇航局的科学家一起在木卫二上发现了冰。

Here she explains to BBC World Service programme, Science in Action, one theory linking ice to the beginnings of life on Earth.

她在BBC全球服务节目《科学在行动》中解释了一个将冰与地球生命起源联系起来的理论。

There's sort of these two alternatives for how you could have had life arise on Earth, and one is that the very basic building blocks, like water, and methane, and CO2 – like, those molecules were definitely brought to Earth by ices in comets, and maybe once they were on Earth, then they reacted with either geothermal heat or some kind of lightning strike to form more complex molecules.

关于地球上生命是如何产生的，有两种替选方案，一种是研究最基本的组成模块，比如水，甲烷，二氧化碳，这些分子肯定是由彗星上的冰带到地球的，也许它们在地球上一出现，就与地热或某种雷击反应形成更复杂的分子。

Earth's primordial soup lacked the building blocks of life – a phrase describing the most basic biological and chemical units needed to support living things, elements like oxygen and carbon.

地球的原始汤缺乏生命的基本组成模块——一个描述支持生命诞生所需的最基本的生物和化学单位的短语，如氧和碳元素。

Professor McClure thinks these missing elements were brought to Earth in comets - large bright balls of dirt and ice which travel around the Sun in outer space.

麦克卢尔教授认为，这些缺失的元素是由彗星带到地球的。彗星是由泥土和冰组成的明亮的大球体，在外层空间围绕太阳运行。

It's possible that when comets hit Earth billions of years ago, elements in the ice were scattered and struck by lightning – a bright flash of light produced by electricity moving in the atmosphere.

有可能是数十亿年前彗星撞击地球时，冰中的元素被撞散并被闪电击中——闪电是由大气中移动的电流产生的明亮闪光。

This resulted in the complex molecules needed for life on Earth.

这就产生了地球上诞生生命所需的复杂分子。

Exactly how this happened is not known, but it involves biomolecules, molecules like DNA which are found in living things.

尚不清楚这究竟是如何发生的，但它涉及到了生物分子，比如生物体内发现的DNA分子。

Ice is not a biomolecule, but when it mixes with carbon, the atoms in ice molecules change to produce complex molecules – and that's when interesting things start to happen.

冰不是生物分子，但当它与碳混合时，冰分子中的原子会发生变化，产生复杂的分子——这时有趣的事情就开始发生了。

Here's Professor McClure again, explaining more to BBC World Service's, Science in Action.

麦克卢尔教授再次为BBC全球服务栏目《科学在行动》做出了更多解释。

If they have a carbon atom in them then they're complex organic molecules, so things like very simple alcohols like methanol or ethanol, like what you would drink, are complex organic molecules.

如果它们里面有一个碳原子，那么它们就是复杂的有机分子，比如非常简单的醇，甲醇或乙醇之类的，就像你喝的酒，也是复杂的有机分子。

And these molecules could react and start a sort of a reaction chain that would eventually lead to something like a biomolecule.

这些分子可以发生反应，并开始一个反应链，最终产生类似生物分子的东西。

Ice can react with other elements to create organic molecules, for example the alcohol, methanol.

冰可以和其他元素反应产生有机分子，比如酒精，甲醇。

Here, the adjective organic means related to living plants and animals.

在这里，形容词有机的意思是与活的植物和动物有关。

That's different from how we use the word to talk about 'organic food', meaning food that hasn't been grown using artificial chemicals.

这与我们谈论“有机食品”的方式不同，“有机食品”指的是没有使用人工化学物质种植的食品。

When these organic molecules met the primordial soup - so the theory goes - it produced a chain reaction – a series of chemical reactions in which one change causes another.

当这些有机分子遇到原始汤时，就会产生连锁反应——一系列化学反应，其中一个变化引起另一个变化。

It was this chain reaction which created the first living cells and eventually, humans.

正是这种连锁反应创造了第一批活细胞，并最终创造了人类。

Quite impressive for a little piece of frozen water!

对于一小块结冰的水来说，这真是令人印象深刻！

Speaking of water, Sam, what was the answer to your question about the chemical symbol for water.

说到水，山姆，关于水的化学符号的问题，你的答案是什么？

I said it was H2O.

我说的是H2O。

Which was the right answer, Neil!

你回答对了，尼尔！

Each molecule of water, and ice, contains two atoms of H, that's hydrogen, joined to one atom of oxygen.

每个水和冰分子，都包含两个H，也就是两个氢原子，和一个氧原子相连。

OK, let's recap the vocabulary we've learned from the programme, starting with primordial soup – the environment on Earth before there were any plants or animals, which created the conditions for life.

好了，让我们回顾一下在节目中学到的词汇，从原始汤开始，原始汤是指没有植物或动物之前的地球环境，它为生命创造了条件。

The phrase the building blocks of life refers to the most basic biological and chemical units needed to support living plants and animals.

生命的基石这个短语指的是支持活着的植物和动物所需的最基本的生物和化学单位。

A comet is a large object travelling in space which orbits the sun and has a bright, burning tail.

彗星是一种在太空中围绕太阳运行的大型天体，它有一条明亮的燃烧着的尾巴。

Lightning is a flash of bright light produced by electricity moving in the atmosphere.

闪电是电流在大气中移动时产生的一种闪光。

The adjective organic means relating to living plants and animals.

形容词有机的意思是与活的植物和动物有关。

And 'organic food' means food which has been grown without using chemicals.

“有机食品”是指在种植过程中没有使用化学物质的食品。

And finally, a chain reaction is a series of chemical reactions in which one change causes another which in turn causes another.

最后，链式反应是一系列化学反应，其中一个变化引起另一个变化，而另一个变化又引发另一个。

Once again, our six minutes are up.

六分钟又到了。

Goodbye! Bye bye!

再见！再见再见！