BBC LEARNING ENGLISH

6 Minute English

How do climate scientists make predictions?

This is not a word-for-word transcript.

Phil
Hello, this is 6 Minute English from BBC Learning English. I'm Phil.

Pippa
And I'm Pippa.

Phil
This summer is becoming one of the hottest ever with heatwaves across Europe. Here in the UK, a new record for the highest June temperature was set at a sweltering 37.7°C. It seems that year after year, temperatures are going up. In 2015, the COP21 summit agreed to limit global warming to 1.5°C, but since then research shows temperatures exceeding that, leading to warnings of catastrophic damage to Earth's life support systems. In this episode, we'll be discussing how hot the planet could get, using some useful new vocabulary. And remember, you'll find a free transcript to read along with on our website, bbclearningenglish.com.

Pippa
But first, I have a question for you, Phil. Scientists monitor climate change using the Earth's energy imbalance – the difference between the solar energy entering the Earth's atmosphere and the radiation going back out into space. But which unit do scientists use for this? Is it:

a) Fahrenheit,
b) Watts per square metre, or
c) Joules?

Phil
Ooh, I know Joules is something to do with energy, so I'm going to go with c).

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Pippa
Well, we'll find out the answer at the end of the programme, although careful listeners might hear the answer sooner.

Phil
Ooh!

Pippa
Yes, exciting! So, how do scientists calculate the effects of climate change in the first place? The answer is with models. Huge amounts of physical and chemical data are fed into supercomputers, which then paint pictures of possible futures on Earth. But, as NASA climate scientist Kate Marvel explained to BBC World Service programme The Climate Question, nothing is certain.

Kate Marvel
Climate models don't make **predictions** – they make projections. **Predictions** are saying this is what will happen and a projection is **conditional**. A projection is: "If we do this, then this will happen."

Phil
Climate models don't make **predictions**. Those are statements about what's likely to happen. Instead, they make projections about different possible futures, and these depend on many things. In other words, climate models are **conditional**, meaning that they depend on other factors. The main factor in climate change, of course, is human activity, especially greenhouse gas emissions.

Pippa
Another influence on climate models is clouds. We usually associate hot summers with cloudless blue skies, but in fact clouds play a big part in the climate, as Kate Marvel explained to the BBC World Service.

Kate Marvel
So, **the thing about** clouds is that they have this dual effect. They both cool the planet by blocking sunlight, and they warm the planet because they have their own greenhouse effect. Right now, the unit that scientists use to measure the energy imbalance of the planet – how much it's **out of whack** – is Watts, like in a light bulb, per square metre.

Phil
Kate starts by saying, "**The thing about** clouds is." She uses the expression **the thing about** to introduce the most important detail about something. Here, that

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detail is that clouds both cool the planet by blocking sunlight but also warm it by trapping heat.

Pippa
So, climate models monitor clouds to accurately measure how much the Earth is **out of whack**. If something is **out of whack**, it's out of balance and not working properly.

Phil
Hmm. Climate models sound very complicated to me, Pippa. For one thing, how can you monitor clouds which are constantly moving and changing?

Pippa
Yeah. And how much information from around the world would the supercomputers need to make accurate projections? It's a concern that BBC presenter Graihagh Jackson raised with Kate Marvel for BBC World Service programme The Climate Question.

Graihagh Jackson
Surely we need to know the trajectory we're heading in, in order to adapt.

Kate Marvel
Oh absolutely. You know, I am very **pro-**science. I am very **pro-**doing science because no climate change is unfortunately **not on the table**.

Phil
Kate is very **pro-**science. If you're **pro-**something, it means you're in favour of it. Models are complex, but they're necessary because unfortunately no climate change at all is **not on the table**, and that's an idiom, meaning it's not an option.

Pippa
If all this sounds a bit depressing. Kate's final message is more hopeful. Climate models prove beyond doubt that the problem of global warming is created by humans, so we know beyond doubt that the solution is also in our hands.

Phil
Now, Pippa, careful listeners might already know but go ahead and reveal the correct answer to your question.

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Pippa
Yes. I asked you, "Which unit do scientists use to measure the Earth's energy imbalance?" And the answer was Watts per square metre. And I didn't know that, Phil. Right, it's time to recap the vocabulary we heard during this programme. A **prediction** is a statement about what you think will happen in the future.

Phil
The adjective **conditional** means depending on other factors.

Pippa
You can use the informal expression **the thing about** to introduce the most important feature or detail of something.

Phil
The phrase **out of whack** means out of balance and not working properly.

Pippa
If you're **pro-**something, you're in favour of it.

Phil
And if something is **not on the table**, it's not an option. It's not available to us.

Pippa
That's the end of this episode of 6 Minute English. Find a worksheet and quiz on our website to test what you've learned.

Phil
We'll be back next week with another episode, so make sure you don't miss it.

Pippa
Bye for now.

Phil
Bye!

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VOCABULARY

prediction
statement about what you think will happen in the future

conditional
depending on other factors; not certain

the thing about…
(informal) used to introduce the most important feature or detail to understand about something

out of whack
(idiom) out of balance; not working properly or broken

pro- (something)
in favour of (something)

(not) on the table
(idiom) (not) considered an option or a possibility

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