

## Climate Change Education: the science is simple, the impacts are serious, the problem is solvable

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Today's young people will feel the impacts of climate change more severely than any previous generation, and will be responsible for the personal and political discussions and changes that will shape the future of the planet. It is therefore imperative that they understand the science, can evaluate the impacts, and engage with the solutions. Teaching has the potential to inspire young people to fix climate change, both by taking action themselves and encouraging others (including 'grown-ups') to do so too. However teaching this topic can be challenging due to a range of factors, including: misinformation in the media, the perceived complexity of the issue, conflicting political discourse, and a lack of well-established teaching structures. Consequently, educators can be put off teaching climate change in depth through a fear of misunderstanding not only the supporting science but also the debate.

We have developed a series of educational resources with the aim of providing an engaging, reliable, straightforward, and logical framework for teaching climate change. We emphasise the "3 Ss" of climate change: that the science is simple, the impacts serious, and the problem solvable (as popularised by Scott Donning, University of Colorado). The science component is broken down into "it's happening", which provides motivation by introducing climate and how it's changing, and "it's us", which covers the greenhouse effect. "It's serious" stresses that the impacts of climate change are overwhelmingly bad and worth tackling. And "It's solvable" stresses that we can fix climate change, through changes in energy supply and consumption.

The materials include lesson plans and interactive activities trialled and developed for delivery through the GeoBus platform (which has taught more than 64,000 pupils since 2012) and by individual classroom teachers. All resources are fully supported and have been launched in conjunction with several teacher training days and conference workshops. In 2017, climate change workshops were delivered by the GeoBus team in more than 20 schools across Scotland with positive feedback from pupils (e.g. quotes such as "informative and fun & my questions on climate change were answered"). In particular, feedback has highlighted the worth of simple hands-on experiments to demonstrate the impacts of climate change – 'Ocean Acidification' is an abstract and complex sounding concept to junior secondary school pupils (12-14years) but a demonstration of water changing colour due to pH changing when CO<sub>2</sub> is added, followed by watching acid fizz on carbonate shells is "cool" and, importantly, memorable. Here we aim to share best practice and highlight these resources for use by educators worldwide.