Calling all climate champions!

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Never before has humankind's impact on this planet been so severe. Rainforests uprooted to make way for pastureland. Plastic littered acidic oceans that bleach and kill coral reefs, increased frequency of deadly tropical storms, expanding deserts and melting glaciers. These are just a few of the key issues of global warming. As a group of STEM students we felt compelled to use our time during lockdown to find out more.

The first scientist to suggest that carbon dioxide emissions could increase surface temperatures was Svante Arrhenius, in 1896. It wasn't until the 1960s that David Keeling proved that human emissions of carbon dioxide were large enough to cause global warming.

Today, the issue of human-induced climate change is a global emergency, with scientists and climate activists engaged in a race to find solutions to human carbon dioxide emissions, before it's too late.

Scientists hope to reduce carbon dioxide emissions to a level where the rate of global warming will be less dangerous. To do this, individuals need to move away from lifestyles and tendencies that lead to the emission of green house gases. This is even more profound for large industries - just 100 companies around the world are responsible for 71% of greenhouse gas emissions.

We are probably familiar with most sources of green house gases - transport, fossil fuels - and within our day to day lives there are things we can do to avoid them - cycle, turn off lights, buy solar panels - but for a large company, or large states or even entire countries, this process is more complex: what is the most efficient means of reducing green house gas emissions? Which solution will have the greatest desired effect on global temperature? Is switching to solar power an economical solution, or is switching to nuclear power more effective?

To answer these questions, last spring a group of students from Chipping Campden School, King's College School, Benenden School and George Watson's College signed up to become Climate Ambassadors as part of an initiative offered by MIT Sloan, linked to the "En-ROADS Climate Solutions Simulator".

A fast, powerful climate simulation tool that allows anyone to explore the likely consequences of energy usage, economic growth, land use etc...

The simulator focuses on how changes in global GDP, energy efficiency, technological innovation, and carbon price influence carbon emissions and global temperature. This is presented as a series of interactive graphs, which the user can control by a series of sliders, controlling the levels of various contributing factors to green house gas emissions. The simulator runs online for free and provides users with a readily accessible source of immediate information. It focuses on how global changes in energy, economics and public policy could affect carbon emissions and climate outcomes.

Greenhouse gases come from transport and burning fossil fuels.

So far, a wide range of people have used En-ROADS, including members of U.S. Congress, HSBC bank, the Hewlett Foundation, the UN Secretary-General's Office, university professors and even Bill Nye!

But how can we use this simulator? Here at Chipping Campden school we have employed the use of this simulator in our community. To allow people (whether student or teacher) to use the software to further their understanding of climate change. By using the simulator, we can gain a better insight into which solutions have what impact and how great that impact is. We can then apply this knowledge to our local community. Knowing what methods of reducing carbon emissions are ideal for us, we can produce an effective, realistic and manageable plan for our local environment. We can then raise awareness within our community.

So how exactly are we planning on doing this? How can other schools do the same?

All students who wish to become climate ambassadors for En-ROADS, must teach at least 5 other people to use the software. We will host training sessions to do this, firstly with selected teachers from our school and then with business leaders in the wider community.

In due course, we will run an outreach programme with younger students in our school and our local primary schools.

The training sessions will incorporate an En-ROADS Role-Playing Game which involves two rounds of Climate Action Simulation. The aim is to reach a scenario under 2°C of warming, before the time is up. This strategy allows participants to explore key technology and policy solutions for addressing global warming. This fun style approach will leave our teachers and wider community with an increased understanding of potential strategies for dealing with climate change. Creating a greater drive to make positive changes.

We are increasing our reach and awareness through opportunities such as contributing to a TEDx talk. In collaboration with King's College London, Benenden School, George Watson's College and Richard Taylor Primary School, last November we discussed the implications of this new simulator. We covered topics inspired by the TED-X Countdown talks 'Why is 1.5°C so important' and 'Why act now?'

Last October we participated in the Royal Institution Youth Summit, where we engaged in constructive discussions and debate with climate change experts and other like-minded students. The climate crisis talks presented global warming scenarios to which we produced solutions. We formally presented our ideas to the lecturers. The level of productivity and creativity at the event highlights the drive amongst students to try and improve climate change. It is this that we are trying to seek out in other students by presenting the En-roads program and raising awareness of the climate crises. As a result of our work we have introduced an award system in our school – 'Chipping Campden Climate Champions' and are working with the Royal Institution to develop a Masterclass series for younger students.

Through this article and our actions above, we hope to encourage you to use the En-ROADS Climate Solutions Simulator. We encourage you to explore potential climate change solutions – whether in your school, local community, or even globally. The simulator is an easy to use, interactive and widely applicable source of information about the effects of climate change solutions. We hope you will begin to train students and staff to use this amazing resource to your advantage and be a climate change ambassador, ensuring you are part of the solution.

Glossary

En-ROADS Climate Solutions Simulator - based on system dynamics modelling, it provides simulations and insights help people see connections, play out scenarios, and see what works to address climate change, inequity, and related issues like energy, health, and food.

Find out more

Tedx Global Youth Countdown
https://vimeo.com/483160046

En-ROADS Climate Change Solutions Simulator
https://www.climateinteractive.org/tools/en-roads

Royal Institution Masterclasses
https://www.rigb.org/education/masterclasses

Countdown to a healthier future
https://countdown.ted.com

About the authors

Ben and Aaron are year 12 students studying for A' levels at Chipping Campden School. They are keen advocates of educating people to understand the ramifications of climate change and how everyone can do their part to effect change. The school runs regular STEM clubs to further enhance student learning and skill sets across this and other topics.