

# Teaching children about climate change and sustainability

Maria Rossini

**Abstract** Schools have a vital role to play in helping young people understand and engage with the pressing issues of our time. More effective and engaging climate education can help prepare them to play their part in combatting climate change. Practical science activities, such as those promoted in the CREST Awards hydrology resources described here, can help young people relate to and contextualise the issues that will inevitably play a formative and significant role in their futures – inspiring, educating and preparing the new leaders, scientists and engineers of tomorrow.

Widespread global attention is slowly but surely turning to the critical issue of climate change. While environmentalism has been a common societal topic since the popular protests of the 1970s (Kestin, Lock and Gralki, 2020), it is only in the last few years that the need to take urgent, collective action has established itself in mainstream culture. With extreme weather events (Masters and Nuccitelli, 2020) sparking widespread climate protests and growing consumer trends towards sustainable products, increasingly individuals are looking to tackle the environmental crisis we are currently facing.

The emergence of renewed emergency climate change action has made it more important than ever to engage children with environmentalism and sustainability topics. Research from the British Science Association (BSA, 2021a) has found 9 in 10 children want to take an active stance in changing the world. While it is common to see younger generations at the forefront of recent environmental campaigns, it is also vital to equip students with the knowledge and skills to make a tangible contribution to tackling one of the biggest issues currently facing society. That is why, in partnership with the UK Centre for Ecology & Hydrology (UKCEH), the BSA has recently created a new series of resources focused on the current challenges and future solutions around climate change, sustainability and one of Earth's fundamental resources – water.

## For young people, by young people

COP26, the global conference on climate change held in Glasgow in November 2021, brought the environmental crisis to the centre stage with politicians, activists, and organisations from across the globe gathering to share ideas, build momentum and find solutions to tackle climate change.

Youth engagement was a key theme at COP26, with the Youth and Public Empowerment Day exploring

ways in which young people can be supported to take action against climate change. Discussions highlighted the value of governments and industry experts listening to, and working alongside, young people to develop solutions for a greener planet together. The conference also acknowledged the unique impact of the climate crisis on younger generations. Speaking in Glasgow, UNICEF Executive Director Henrietta Fore recognised climate change as a crisis for children and their rights, describing how, if left unaddressed, the crisis places over 1 billion children at '*extremely high risk*' (UNICEF, 2021).

While conference attendees discussed how to empower young people, arguably the most empowered environmental youth activist led protests outside. At just 15 years old, Greta Thunberg began a protest outside the Swedish parliament, calling for a '*school strike for climate*', lobbying government leaders to meet carbon emission targets (Kraemer, 2021). By 2019, she had inspired over 20 000 students across the world to skip school in protest and now is a prominent environmental leader, leading international climate activism efforts.

An increased awareness of issues surrounding climate change has led many other children and young people to act. Donald Campbell, at 15 years old, embarked on a research project into the impact of COVID-19 lockdown on improving air quality, using the BSA's Gold level CREST Awards (Newsround, 2020). Ella and Caitlin McEwan, aged 10 and 8, started a petition calling for the end of plastic toys in McDonald's and Burger King meals, after learning about the environment and ocean waste at school (BBC News, 2019). Vic Barrett, a 20-year-old college student, has become prominent in the US for his role in efforts against climate change, after witnessing first-hand the impact of Hurricane Sandy and learning of the link between extreme weather events and climate change. He is one of 21 plaintiffs in the ongoing suit against the US government, actively suing for the

American administration to take meaningful action to fight climate change (Our Climate Voices, 2019).

Environmental education must go further than just awareness. The next generation must be equipped with the necessary skills and knowledge to make substantial change in the climate crisis.

## From news cycles to new curriculum

Despite headline-grabbing youth leaders spearheading discussions of climate change and the environment, a recent study by Pearson demonstrated this is yet to be translated into substantial education on climate change and sustainability within schools. The Global Learner Survey 2021, *Making the grade for climate education: I learned about the weather, but not climate change* (Pearson, 2021), gave a platform to over 5000 learners across the world. It amplified their frustration at the lack of climate education included in current curricula, with 77% of participants stating they are actively trying to learn more about climate issues as they had not received enough education on these topics in school.

The report also noted that 88% of participants believed schools have a responsibility to teach students about climate and environmental issues. A school curriculum should reflect the issues facing and being

discussed by students and society, providing a timely and relevant education that will enable children and young people to digest, participate in and have impact upon, the world around them. The launch of the Government's draft strategy for sustainability and climate change education certainly signals a shift in the right direction, with new initiatives including the development of a Primary Science Model Curriculum and increased support training, and resources for teachers to effectively deliver climate education (DfE, 2021).

It is more important than ever that a range of subjects, including science, technology, engineering and maths (STEM), meaningfully engage students with sustainability and the environment.

## Resources to save our resources

There is a clear need and desire for students to access science education that engages with the current challenges and practical solutions. Project-based work, an investigative style of learning that encourages students to take ownership of a topic and learn independently, can be an effective way to help students engage deeply with complex climate change issues and concepts. For example, the free 'Hydrology' CREST Awards resource packs (BSA, 2021b) (Figure 1), developed with the



**Figure 1** The CREST Awards resource packs

UKCEH, help students investigate the real-world impact of climate change on the world's water cycle. Students can undertake these projects by tackling a variety of hydrology-focused challenges and developing innovative solutions, from creating SMART water solutions and emergency flood plans, to planning responses to food shortages and droughts. In the process, students will learn the impact of climate change on water supplies, agriculture, infrastructure, public health and more.

The resources can be used both inside and outside curriculum time, and offer a chance for teachers to engage students through practical and scenario-based projects. As well as engaging students with the real-world science and solutions behind climate change, the resources encourage students to take the lead in their own investigations, explore science in a meaningful way and enrich their learning while building an interest in STEM subjects and careers.

Project-based work is a fantastic way to bring science to life as students explore their unique topics of interest and experiment by finding solutions, encouraging them to become engaged young scientists. An in-depth understanding of climate change issues will help students relate more personally to the crisis, as well as providing insight into the extent of the problem we face. This knowledge and invested personal interest will aid the establishment of fundamental green values and attitudes, which will encourage life-long environmentally friendly habits and interests.

Teaching children about complex environmental issues can be challenging, so choosing resources that include a range of interactive and scenario-based projects, and feature both student briefs and teacher guides is key. A commitment and desire to deliver flexible and interesting climate education that also raises awareness of key issues should be replicated and expanded on throughout the curriculum, not only in science lessons.

## A greener education for a greener future

The COVID-19 pandemic has presented a unique opportunity for climate action, providing a chance to 'build back better' by focusing on a green recovery plan for economies across the world (Barrie and Schröder, 2021). With global leaders looking to green jobs to lead economic recovery from the pandemic, there will be an inevitable increase in demand for a workforce equipped with the skills and knowledge that can prepare them for these roles. This green education must start within schools, if we are to meet the workforce demands of tomorrow.

The shift to 'greener' jobs can be seen within STEM careers. Climate change and environmental issues are

among the biggest facing the scientific community, as jobs in environmental science, renewable energy and other sustainability related specialties are predicted to grow by 8% in the US over the next decade (Smith, 2021).

With 89% of young people believing the education systems in their country need to do more to equip students with skills for green jobs (Pearson, 2021), science curricula must be adapted to reflect the current crisis and the demands of a greener future. Conducting practical, scenario-based project work through the Crest Awards scheme will help students to gain insight into the extensive range of professions and sectors connected to these issues.

A generation of environmentally aware consumers can also have significant impact on climate change efforts. With 20 fossil fuel companies responsible for 35% of global greenhouse gas emissions (*The Guardian*, 2019), widespread behavioural change among consumers is required to motivate these large companies to end damaging practices. Efforts on an individual level, such as recycling and consuming responsibly, will have the most impact when overall consumer demand starts to shift, motivating large corporations to take action at the top level.

Consumer trends have already begun to see a shift in business practices, with sustainability and a reduction in waste becoming more popular. With ethical and sustainability issues being found to be a key motivator for almost a third of consumers (Deloitte, 2021), comprehensive climate education can help establish new generations of eco-friendly consumers that will in turn encourage positive climate action from some of the world's largest polluters.

## Conclusion

Schools have a vital role to play in helping young people understand and engage with the pressing issues of our time. More effective and engaging climate education can help prepare them to play their part in combating climate change. Practical science activities can help young people relate to and contextualise the issues that will inevitably play a formative and significant role in their futures – inspiring, educating and preparing the new leaders, scientists and engineers of tomorrow.

Despite the admirable and inspiring efforts of youth climate leaders and the importance of educating and engaging today's students with environmental issues, it also must not be forgotten that young people do not bear the burden of climate change alone. It is the responsibility of everyone and can only truly be tackled by all of us, with education and awareness being merely the first step.

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**Maria Rossini** is Head of Education at the British Science Association. Email: [maria.rossini@britishscienceassociation.org](mailto:maria.rossini@britishscienceassociation.org)



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