



## Climate change education for sustainable development

BY

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### Abstract

*Promoting climate action requires education. It aids individuals in comprehending and addressing the effects of the climate catastrophe by equipping them with the information, know-how, values, and attitudes necessary to engage as change agents. UNESCO has been promoting education as a key component of the global response to climate change through its program on education for sustainable development. As a global advocate and with the goal of enhancing governments' abilities to deliver high-quality climate change education, UNESCO creates and disseminates research, offers policy direction and technical support to its member states, and puts projects into action.*

**Keywords:** Climate change; sustainable development, Education, Environment, mitigation adaptation and resilience.

### Introduction

Long-term changes in temperature and weather patterns are referred to as climate change. These changes could be caused by natural processes, such as oscillations in the solar cycle. But since the 1800s, human activities—primarily the combustion of fossil fuels like coal, oil, and gas have been the primary cause of climate change. Fossil fuel combustion produces greenhouse gas emissions that serve as a blanket around the planet, trapping heat from the sun and increasing temperatures. Carbon dioxide and methane are two examples of greenhouse gas emissions that are contributing to climate change. These include, for instance, burning coal to heat a building or using gasoline to drive a car. Carbon dioxide can also be released during forest and land clearing. Methane emissions are primarily produced by waste landfills. Among the major emitters are energy, industry, transportation, buildings, agriculture, and land use.

Human activities, such as using cars, producing electricity, and clearing forests, rather than climatic changes, are the main contributors to climate change. As a result of these human activities, greenhouse gases are released into the atmosphere, slowly warming the earth and causing climate change (Center for climate and energy solutions, 2019).

Education on climate change tries to address the issue and create practical solutions. It aids students in comprehending the causes and effects of climate change. Learners are given the tools they need to take appropriate action to adopt more

sustainable lives as well as to be prepared to cope with the effects of climate change. Climate change education helps communities who are already at risk of being negatively impacted by climate change become more resilient (Unesco, 2015).

The 2010-launched Unesco program on climate change education for sustainable development intends to increase climate change education initiatives in non-formal education through media, networking, and collaboration. It is based on the integrated approach to education for sustainable development, which takes into account important issues with sustainability including climate change, catastrophe risk reduction, and others. Integrating the connection of social justice, economic viability, and environmental sustainability into education. Additionally, it encourages the use of interactive teaching and learning strategies that inspire and equip students to adopt new habits and take initiatives for sustainable growth.

Climate change is a result of humans. Climate change, shifting shorelines, diminishing agricultural productivity, a food supply problem, water availability, population health, and extreme weather events all have an impact on humans. There will be a difference in how these effects are felt in wealthy and poor countries. Declines in species abundance and variety of ecosystems on which marginalized populations of people rely at a landscape level may have an impact not

only on their lives and livelihoods but also on them. Urbanization and industrial expansion may possibly put more pressure on protected area networks in heterogeneous landscapes that contain a mix of wilderness islands within a shifting agricultural context as the effects of climatic change worsen.

### Objectives of Climate Change

The main objectives of the climate change awareness campaign are:

1. To improve awareness and understanding of climate change amongst citizens
2. To demonstrate that daily activities can collectively make a big difference and that each individual has a role to play in the fight against climate change; and
3. To motivate citizens to undertake these small, significant changes to their daily routine.

### Climate change education

Stanford University (2020) asserts that the effects of global climate change on people and resources provide significant societal issues. The decisions we make today will have an impact on how much warmth there will be in the future, how much greenhouse gas emissions will increase, how well we can adapt to changes, and how vulnerable people and places are to harm. In order to implement solutions, both at the social and individual levels, it is crucial to educate future generations on the causes and consequences of global climate change.

In order to help students comprehend the phenomena of climate change, the justification for these phenomena, and why these phenomena are both scientifically and socially important, this curriculum integrates ideas from the earth, life, and physical sciences as well as the most recent data on climate systems. Particularly, the following student objectives serve as the unit's framework and are integrated into the instructional plans:

1. Students will be able to define climate components and examine how the energy balance of the planet affects climate change. (What is global warming?)
2. Students will be able to recognize the different types of evidence that are used to chart climate and utilize that evidence to identify the root and proximate causes. (How do we know what is causing climate change and what is the cause?)
3. Students will be able to evaluate how climate change affects biological, environmental, and social systems. Why is climate change important?
4. Students will be able to contrast mitigation and adaptation options (macro and micro) for climate change in light of their effects on the environment, the economy, politics, and ethics. What are our options?
5. Students will support assertions about climate, climate change, and climate mitigation with data and evidence.

### Importance of climate change in education

Promoting climate action requires education. The importance of climate change education includes the following:

1. It gives people the knowledge, abilities, values, and attitudes necessary to act as change agents, enabling them to comprehend and address the effects of the climate catastrophe.
2. The likelihood of snow and hail reaching the surface can be calculated using latitude.
3. It makes it easier to determine how much solar thermal energy is available in a given area.
4. Climate change promotes job growth
5. Climate change improves both domestic and international security
6. Giving farmers benefits
7. Giving low-income households benefits
8. Maintaining important habitats and species
9. Preserving clean water and water resources
10. Growing competitiveness
11. Economic expansion
12. Access to more pristine air
13. Technology development (Union of concerned scientists, 2009)

### The effects of climate change to students

According to the available data, climate change may have a direct impact on the educational sector through factors such as infrastructure damage, loss of educational resources, injury or death of students, teachers, or parents, and psychosocial stress brought on by exposure to extreme weather events.

1. Home damage
2. Increased electricity costs and more blackouts
3. additional allergies and health risks
4. Food may become more expensive and less varied, and water quality may decline.
5. increasing taxes
6. Exercise outside and leisure activities will be challenging xi. Travel disruptions (Renee, 2019)

### Role of education in climate change mitigation adaptation and resilience

In order to increase awareness and encourage behavioral modification for climate change adaptation and mitigation, education is crucial. By empowering people to make educated decisions, it improves communities' capacity to mitigate and adapt to climate change (Alan, 2019).

First, securing and utilizing the social and material resources that make up education infrastructure can lessen vulnerability and increase resilience. Second, enhancing general education can boost adaptive capacity. General education is gauged by factors including literacy, attendance, and overall academic achievement. Third, preparing for and maximizing learning in adaptation practice by applying adaptation learning support (Feinstein & Mach, 2019).

In order to reduce the increased food risk caused by sea level rise or to prepare agricultural markets for longer droughts due to higher temperatures, resilience breaks down the enormous job of climate change into locally doable tasks. The particular effects of climate change on different communities are highlighted by resilience (Bill, 2018).

The following are some tips on how to increase your resilience in the face of climate change:

1. Create strong foundations through quick and inclusive development: Climate change vulnerability is strongly predicted by poverty and a lack of access to essential services like infrastructure, financial services, health care, and social protection. The impoverished communities are those that are most impacted by climate change. Without guaranteeing high-vulnerability populations have the monetary, institutional, and technical resources they require to adjust, no adaptation approach can be successful.

2. Encourage individuals and businesses to contribute: Many families and businesses already have incentives to adapt, but they need assistance getting over roadblocks such as a lack of information and funding, behavioral biases, and unreliable markets. Governments may disseminate information on climate hazards, define roles and obligations, encourage innovation and access to the best technology, and guarantee that everyone has access to financing, particularly for solutions that have large upfront costs. Additionally, they will need to directly assist the most vulnerable populations, who cannot afford to invest in adaptation but are most susceptible to the catastrophic effects

3. Update land use plans and safeguard crucial infrastructure: In addition to providing direct assistance to individuals and companies, governments also have a responsibility to safeguard public investments, assets, and services. It is crucial that urban and land use plans adapt to changing long-term climatic hazards to prevent people from being trapped in high-risk locations since they have a significant impact on significant private investments in housing and productive assets.

4. Assist in the quicker and better recovery of individuals and businesses. Governments must create plans to make sure that when disasters do strike, individuals and businesses can deal with them without terrible long-term effects and can recover fast of climate change.

5. Control effects at the macro level: Dealing with the effects of climate change in a single economic sector is already challenging. Strategic planning at the highest levels is required to deal with the effects of climate change in all sectors at once. Climate change will have an impact on the financial situation and tax receipts through a variety of effects in a variety of sectors, such as floods affecting home prices and ecosystem changes affecting agricultural production.

6. Set priorities based on needs, implement across sectors, and track progress: In addition to setting priorities for actions to be compatible with capacity and resource availability, governments must also establish a strong institutional and legal framework as well as a standardized system for tracking progress. An adaptation and resilience strategy's main goal is to ensure that all government

departments and public agencies adopt the strategy and mainstream it into all of their decisions. It also aims to ensure that governments continuously monitor and evaluate the effects of their decisions and actions so they can address any issues and modify their course of action as necessary (The World Bank, 2020).

Rangwala & Burke (2018) list several ways that cities might create communities that are climate resilient:

1. Adapt early warning systems to the needs of people in vulnerable situations
2. A map of the city's amenities and services
3. Include long-term resilience in planning and infrastructure.
4. Encourage a diverse culture

### Effects of climate change on girls

Girls are frequently the first to leave school during times of hardship in order to assist their families with financial matters, perform household duties, or take care of their siblings. They are less likely to learn about climate change and how to combat its effects if they are not in school.

1. Child marriage: Child marriage can be considered as a solution to lessen the financial burden of taking care of girls when families' income and ability to exist is at jeopardy.

2. Violence: Girls are more vulnerable to violence and exploitation, including as sexual and physical abuse and human trafficking, during and after catastrophic weather events. These dangers are increased when gathering food, water, and firewood or when utilizing makeshift shelters.

3. Sexual and reproductive health and rights: When health services are disrupted as a result of catastrophes, there is an increase in unintended pregnancies and issues with sexual and reproductive health. Girls' knowledge of these topics may also be limited by their lack of access to school.

4. Health: When food is scarce, girls are more likely to go hungry. Additionally, several infections may affect girls more severely than boys if they are already dehydrated or malnourished, especially during menstruation, pregnant, or newlywed mothers (Plan International, 2022).

### Ways to teach climate change in classroom

Anya (2019) lists the following methods for teaching about climate change in the classroom:

1. Conduct a lab: One of the best methods to explain to kids how global warming functions on a manageable size is through laboratory activities.
2. Play a documentary about climate change or materials produced in collaboration with the National Wildlife Federation

3. Participate in citizen science: A teacher can ask students to gather water samples from nearby rivers or streams to submit for a project. In order to track changes in weather patterns over time, the teacher can also encourage his students to measure temperatures and take images of cloud formations.

4. Assign a research assignment, multimedia presentation, or speech. Teachers can help students focus their speeches on important themes including the use of plastics and environmental concerns.

5. Share a personal story: A teacher can inform pupils of how the climate has changed, becoming drier and hotter.

### Ways students can help reduce climate change

Kevin (2021) suggests that the following strategies can assist students in limiting climate change:

1. Get engaged. Look for local groups in your area that are working to combat climate change. Protest, raise money for awareness campaigns, donate to them, post about them on social media, write to your state and local politicians, and enlist the help of friends.

2. If you are old enough to drive, select a fuel-efficient car, or even better, an electric one. Encourage adults to do the same. Encourage your friends, parents, and teachers to drive eco-friendly vehicles as well.

3. Use less water waste: Creating clean, useful flowing water requires a significant amount of energy. By using less water, you can lower the energy needed to supply you with water. Adults in your life should be encouraged to buy water-saving appliances.

4. Use light-emitting diode bulbs instead of other types of bulbs because they can last 25 times longer and consume 75% less energy. A cheap option to save energy is to replace the bulbs in the lights in your room. Getting your parents and your school on board with the change can have an even greater impact.

5. Be mindful of wasting energy; you may help the environment by turning off lights and electronics when not in use. Plugging electronics out of the wall while not in use will help you save a little more energy. The issue of climate change could appear frightening, overwhelming, and difficult to solve. To help stop climate change before it is too late, there are things you can do right away.

### Role of students in climate change

According to Brooks (2022), students can help to climate action by making the following little changes:

1. Making use of transit
2. Assisting campus sustainability departments or organizations with green projects
3. Inquiring about administrators' intentions for more environmentally friendly school operations

4. Buying hygiene goods created without harsh chemicals or apparel made from low impact fibers to demonstrate your increased consumer consciousness.

### How can we increase climate change awareness?

Kellogg & Hunter (2022) list the following strategies for raising public understanding of climate change:

1. Share breaking news on social media to reach all of your friends and family. Look online for climate change-related videos, news stories, and recent studies from reputable sources. Share the links on your Facebook, Twitter, or Instagram feeds and urge others to do the same.

2. Bring up scientific studies and evidence to persuade skeptics with the information you have gathered. Make sure to research the most recent studies you can find from reliable sources, such as the government climate webpage.

3. Use actual instances from your life; discuss the consequences of not seeing the big picture. Some individuals might not be aware of the consequences of climate change or have no idea how serious a problem it is. Talk about the changes brought on by climate change in your area so they can better understand the issues.

4. Discuss comprehensive solutions to the issue; emphasize finding ways to make people aware that change is possible. Despite the fact that climate change is extremely unsettling and sometimes seems inevitable, many individuals are working to make things better. By describing the measures that nations and groups around the world are taking to assist, you can give the person hope.

5. Talk about individual initiatives to combat climate change; inform people of the preventive measures they may take at home. Everyone may take a variety of steps to lessen their carbon footprint and halt climate change.

6. Post awareness materials: use some straightforward signage to reach members in your neighborhood. A number of ready-made posters are available online, or you can create your own. On your poster, include some information that will help you make your point, like statistics about the melting of glaciers or forecasts of rising sea levels.

7. Produce artwork that addresses climate change and uses it to illustrate its consequences and visuals. Since so many people are inspired by art, it can be an excellent method to express your worries about climate change.

8. Deliver presentations on climate change and use a simple visual slideshow to demonstrate what you have learned. You can discuss climate change as a whole or delve more into a couple of its implications.

9. Participate in a community climate committee as a volunteer to support the environment in your area. Look for organizations in your city or neighborhood that are actively trying to improve the area. They might work to improve the

green spaces in your neighborhood, create new homes for wildlife, and plant new, climate-adaptive plants.

10. Have a donation to a charity; donate money to those who can make a bigger impact. Many non-profit organizations aim to protect the environment and raise public awareness of climate change.

## Causes of climate change

Over the course of our planet's history, climate change has always been a reality. However, given that it is a product of human activity, the global warming that we have been witnessing for roughly the past 150 years is unusual. In addition to the organic greenhouse effect, there is also one known as the anthropogenic greenhouse effect. Among the causes are:

1. The earth's climate and heat-trapping greenhouse gases  
Greenhouse gas emissions
3. Sunlight energy reflection or absorption
4. Modifications to the earth's rotation and orbit
5. Changes in the sun's activity
6. Modifications in earth's reflectivity
7. Violent Volcanic Activity (National Museum of Natural History of the Smithsonian, 2018)

## Solutions to climate change

Climate change can be slowed down by everyone. The following can be done to combat climate change, from the way we travel to the electricity we use and the food we consume:

1. Conserve energy: Coal, oil, and gas are major fuel sources for electricity and heating. It is recommended to use less energy by turning down the heating and cooling, switching to LED lightbulbs and energy-efficient electric appliances, washing our clothing in cold water, or hanging things up to dry rather than using the dryer.

2. Reduce, reuse, and recycle: lessen the amount of waste you produce. To protect natural resources and landfill space, adhere to the three "R's".

3. Volunteer: Participate in cleanup efforts in your neighborhood. The watershed can be protected by students as well.

4. Educate: By improving your own knowledge, you may better inform others about the significance and worth of our natural resources.

5. Conserve water: Less runoff and wastewater will eventually enter the ocean the less water you use.

6. Plant a tree; they release oxygen and food. They aid in energy conservation, air purification, and halting climate change.

7. Eliminate the use of harmful chemicals in your home and workplace and stop dumping them into waterways (National Ocean Service, 2021)

## Conclusion

People who receive education are more likely to adopt new attitudes and behaviors, as well as make more informed decisions. Young people can learn about the effects of global warming and how to adapt to them in the school. All individuals are empowered by education, but young people are especially inspired to take action. Knowing the truth helps dispel apprehension surrounding a topic that is typically portrayed in the media as being doom and gloom.

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