

"EMPOWERING CLIMATE LEADERS: A GUIDE TO HANDS-ON CLIMATE EDUCATION"

Inspiring Action and Leadership for Environmental Sustainability



ACKNOWLEDGEMENT

We are proud to present this booklet, a groundbreaking initiative of our Community Partnership Project, which pioneers climate education and environmental sustainability among school students. In collaboration with Climate Class Connection, we have crafted a comprehensive resource that empowers young minds to confront the climate crisis and shape a sustainable future.

The authors, Sehrish Muluk and Nouman Alam, have created this masterpiece that integrates climate education into the curriculum, equipping students, educators and parents with the knowledge and skills to tackle the climate crisis practically in their classrooms and beyond.

Our heartfelt gratitude goes to the dedicated stakeholders who have made this project possible. We thank the school management, principal, teachers, parents, community members, Climate Class Connection, CDA, Teach For Pakistan, esteemed donors, and individual champions who have contributed their time, expertise, and resources. Your unwavering support has been the driving force behind this project, and we are forever grateful.

This booklet is more than just a resource - it's a call to action. We hope it inspires students, teachers, and the wider community to join forces in addressing the climate emergency and creating a better future for all. The student activities spotlighted in this booklet showcase the impact of collective action and serve as a testament to the power of young people in driving change.

Together, let's harness the energy and creativity of our youth to build a sustainable tomorrow. Thank you for being part of this journey!

Table of Contents

01	Introduction
02	Climate Education and Leadership
03	Climate Change Curriculum
04	Introduction to Environmental Sustainability
05	Teacher Role in Climate Education and Student Leadership
06	Spotlight on Student Actions: Community Partnerships for Climate Change Solutions

INTRODUCTION



Climate change is a global crisis, but its impacts are not evenly distributed.

Pakistan, although contributing only 0.9% of global greenhouse gas emissions, is one of the most vulnerable countries to climate change.

Education is a vital component of climate change action because it plays a crucial role in equipping current and future generations with the holistic knowledge and skills to address climate-related challenges at local, national, and global levels.

The education system in Pakistan has been severely affected by climate-induced disasters such as floods, storms, heatwaves, and drought. This has resulted in prolonged school closures and significant learning losses for children.

In 2022, the floods disrupted education activities and destroyed nearly 27,000 government schools⁵. As a result, 2 million children across Pakistan could not access education during this time.

The human cost of these disasters is staggering. Over the past 20 years, Pakistan has consistently ranked among the top 10 most vulnerable countries on the Climate Risk Index, with 10,000 fatalities due to climate-related disasters.



Learning about climate change isn't just about reading books or listening to lectures. It's about getting your hands dirty, exploring the world around you, and seeing how climate change affects you and your community. This is what we call "hands-on climate education". It's like a science experiment, but instead of being in a lab, you're in the real world.

When you learn this way, you don't just understand climate change, you feel it. You see how it's changing your world, and you want to do something about it. That's where leadership skills come in. We need leaders who understand climate change and are ready to act. And that could be you!

IMPORTANCE OF HANDS-ON CLIMATE EDUCATION



PURPOSE

The purpose of this booklet is to empower teachers and students with the knowledge, resources, and strategies needed to engage in climate education and take meaningful action toward environmental sustainability. By providing comprehensive guidance and practical tools, the booklet aims to inspire a generation of informed and proactive leaders who are equipped to address the urgent challenges of climate change and contribute to a more sustainable future for our planet.

TARGET AUDIENCE

- Teachers: Learn how to teach about climate change and inspire students to act.
- Students: Explore cool activities and ways to help the environment, both at school and in your community.
- Community Partners: Find ideas for working together with schools to support environmental projects and initiatives.

CLIMATE EDUCATION AND LEADERSHIP

Climate education and leadership are paramount in today's world, especially considering the load of environmental challenges we face. In the context of Pakistan, a country fighting issues like water scarcity, deforestation, and extreme weather events, the significance of climate education and leadership cannot be overstated. Let's delve into why schoolteachers, students, their parents, and policymakers must prioritize this aspect:



EMPOWERING TEACHERS

Teachers shape young minds by integrating climate education into various subjects. For example, a geography teacher in Lahore can discuss urbanization's impact on local climates, while a biology teacher in Karachi can talk about mangroves' role in coastal protection. By incorporating climate education into diverse subjects, teachers provide students with a comprehensive understanding of environmental issues.

INFLUENCING POLICY

Climate-educated youth drive meaningful change by advocating for stricter regulations on industrial pollution and urging the preservation of mountain ecosystems. By presenting their findings to policymakers and building public pressure, students influence policy decisions that prioritize climate action.



ADVANCING STUDENT ENGAGEMENT

Students take action based on climate education. For instance, students in Islamabad design compost processes for plants growth and tree plantation drives in rural Sindh to combat climate change. By involving students in projects and initiatives, climate education empowers them to make a positive impact and cultivates a sense of responsibility.

BUILDING RESILIENCE

Climate education equips individuals and communities with the knowledge and skills to adapt to climate-related risks. For example, disaster preparedness training in rural

Punjab and climate-resilient agriculture practices in Gilgit-Baltistan help communities mitigate flood and drought risks. By addressing climate challenges nationwide, climate education fosters sustainable development and resilience.



In essence, climate education empowers individuals to become stewards of the planet, paving the way for a greener, and healthier and sustainable future of Pakistan.

ENGAGING PARENTS

Parents' involvement is crucial in promoting sustainable practices at home and in communities. For example, parents in Peshawar can teach water conservation techniques, while families in Quetta can adopt eco-friendly habits like composting. Engaging parents fosters a culture of environmental stewardship within families.



CLIMATE CHANGE CURRICULUM

DIFFERENCE BETWEEN CLIMATE AND WEATHER

Studies show vast gaps in curriculum space and funding for climate education. Out of 100 countries surveyed by UNESCO in 2021, only 53 national curricula refer to climate change or environmental sustainability. And educational initiatives receive a negligible share of climate action funding. The result is that schools and teachers face a very constrained context and must often use their creativity or extra time to teach about climate change.

WEATHER

Weather is what's happening outside right now. It's like the mood of the atmosphere. Just like our moods can change from sunny to rainy, so can the weather.

Weather is only temporary. For example, a storm can turn into a flood after just a few warm spring days.

Here are some more cool examples of weather:
Sunny Days: Imagine a bright day with the sun shining high up in the sky, making everything warm and cozy. That's what a sunny day in Pakistan feels like! You can wear your favorite sunglasses and enjoy playing outside.

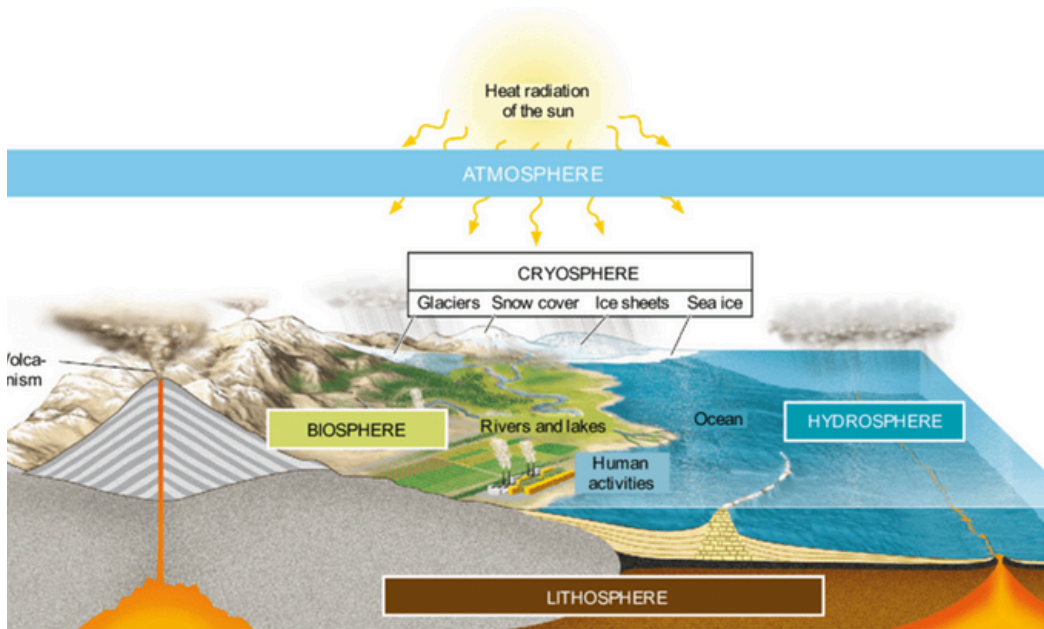
CLIMATE

The climate, on the other hand, is more than just a few warm or cool days. Climate describes the typical weather conditions in an entire region for a very long time—30 years or more.

Climate is the average weather pattern of a place over a long period. It's like the personality of the weather in a particular area!

Pakistan Climatic Regions:

- Hot and Dry Climate: Sindh and Balochistan
- Mild Climate: Islamabad and parts of Punjab
- Cold Climate: Gilgit-Baltistan and Khyber Pakhtunkhwa



GREENHOUSE GASES

The gaseous component of the atmosphere may be natural or anthropogenic. Greenhouse gases absorb and emit radiation, which causes the greenhouse effect¹¹. The primary greenhouse gases are:

- oWater vapor (H_2O): When we burn fossil fuels or use water for farming and livestock, we add water vapor to the air. Industrial processes also release water vapor as steam.
- oCarbon dioxide (CO_2): Cars, trucks, and power plants burning fossil fuels produce carbon dioxide. Deforestation and certain industries like cement production also release CO_2 into the air.
- oNitrous oxide (N_2O): Farming, burning crop residues, and organic matter in wastewater treatment plants release nitrous oxide into the air.

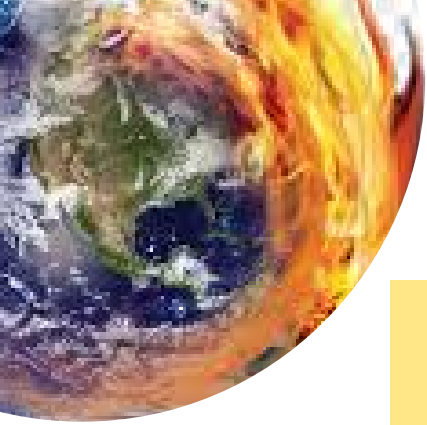
CLIMATE SYSTEM

The climate system is formed by the interactions of its five components:

- Atmosphere: The mixture of gases that surround the earth.
- Lithosphere: The continents and sea floor.
- Biosphere: The earth's marine and land biodiversity.
- Cryosphere: The earth's ice and snow masses.
- Hydrosphere: The earth's liquid water, including fresh and salt water.



The Greenhouse Effect is like a natural blanket around Earth. It keeps us warm by trapping some of the sun's heat in our atmosphere. But when we burn fossil fuels, we add more of these heat-trapping gases, making the blanket thicker and our planet warmer. It's like having too many blankets on a hot night—it gets uncomfortable. So, we need to be careful and not add too many of these gases to the air.



GLOBAL WARMING

Global warming refers to the long-term heating of Earth's climate system caused by human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth's atmosphere.

But don't worry, there's good news! We can all do our part to help stop global warming.

We can walk or ride bicycles instead of always using cars, plant more trees in our school and nearby homes to clean the air, recycle our trash, and use less electricity by turning off lights and gadgets when we don't need them.

What Can We Do?

CAUSES OF GLOBAL WARMING

- Cars and Traffic Jams: Release smoke with "carbon dioxide," a greenhouse gas. Like a thick blanket, these gases trap heat, warming the Earth.
- Deforestation: Fewer trees mean more carbon dioxide, adding to global warming.
- Burning Trash: Smoke warms the Earth, like adding extra blankets.

- Using Too Much Electricity: Using too much electricity, leaving lights on, or using many gadgets makes power plants work harder, releasing more greenhouse gases
- Waste and Landfills: As the trash rots, it produces a gas called methane, which is another greenhouse gas.

CLIMATE CHANGE

Climate change refers to long-term shifts in temperature, precipitation patterns, and other aspects of the Earth's climate system. It's primarily caused by human activities such as burning fossil fuels, deforestation, and industrial processes, which release greenhouse gases into the atmosphere and alter the Earth's natural balance.

IMPACT OF CLIMATE CHANGE IN PAKISTAN

Pakistan is facing severe problems of climate change. Each part of Pakistan is affected by Floods, extreme weather events, droughts in some parts, water shortages, etc. due to climate-induced disasters.



In Pakistan's vast and varied lands,
From Gilgit's peaks to Karachi's sands,
A tale unfolds of changing days,
Of climate shifts in many ways.

In Gilgit-Baltistan, where glaciers gleam,
The ice is melting, like a dream.
Streams run dry, the mountains sigh,
As warming temperatures reach the sky.

In Azad Kashmir, the forests weep,
As flames devour, the mountains steep.
The air grows thin, the earth cries out,
For a world where nature's not in doubt.

In Peshawar's streets, the heat waves rise,
As summer's grip tightens its ties.
The air is thick, the sun beats down,
In a city where green spaces drown.

In Lahore's gardens, once lush and green,
The blooms are fading, the trees lean.
Pollution clouds the city's view,
As climate change takes its toll anew.

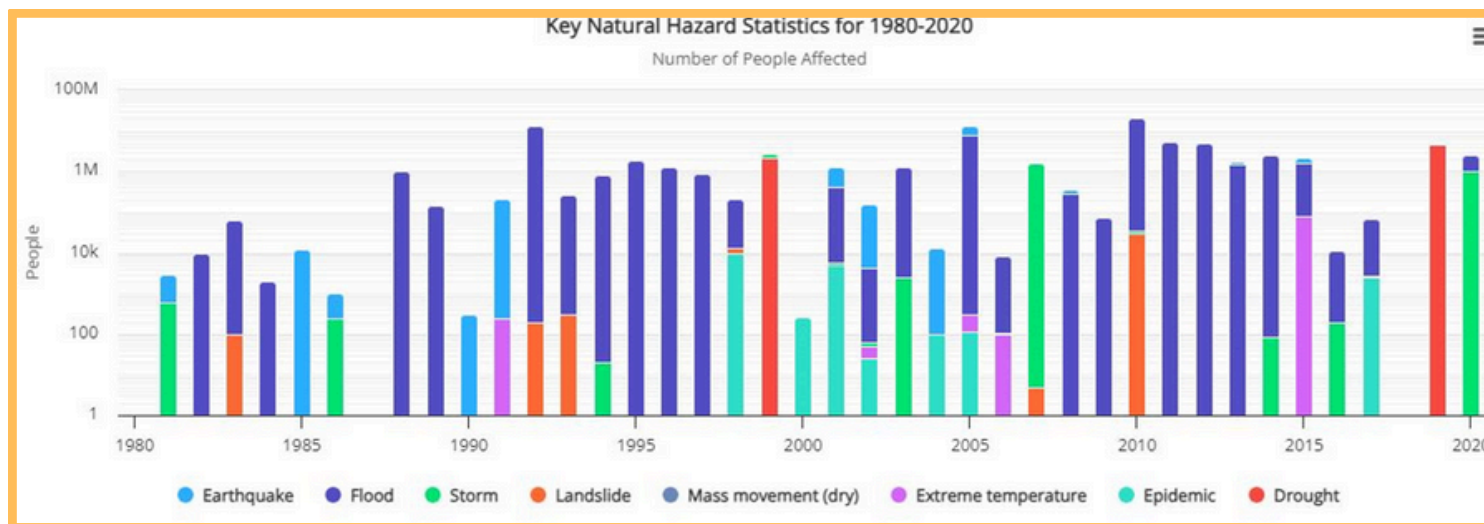
In Karachi's hustle, by the sea,
The waves grow stronger, wild and free.
Storms brew fierce, the coast erodes,
As rising seas encroach abodes.

In Quetta's plains, where dust storms blow,
The desert spreads, the winds doth sow.
Water scarce, the land grows dry,
As climate change looms in the sky.

But in Pakistan's hearts, the hope still gleams,
For a future where nature redeems.
With every step, with every hand,
Let's protect our precious land.

For climate change knows no borders, no creed,
It's up to us to plant the seed.
In Gilgit, Karachi, and everywhere,
Let's join hands for a world more fair.

The following Diagram shows the increasing trend in extreme weather events due to climate change from 1980 to 2020 in Pakistan (World Bank).



THE IMPACTS OF CLIMATE CHANGE IN PAKISTAN

1. Melting of Glaciers:

Pakistan is home to more than 7,000 glaciers, primarily located in the Himalayas, Hindu Kush, and Karakoram Mountain ranges. However, rising global temperatures linked to climate change are causing these glaciers to melt rapidly. The Passu Glacier in Gilgit-Baltistan has melted so much that it caused a flood in a village, washing away homes and hurting people.

2. Severe Weather Events:

- Floods: At least 25,993 schools in the regions of Sindh, Balochistan, Punjab, and KP were damaged or destroyed due to the 2022 floods.
- Heatwaves: When it gets very, very hot for a long time, it's called a heatwave. In Karachi, a heatwave in 2015 killed 1200 people and made over 65,000 people so sick they had to go to the hospital.
- Droughts: Droughts happen when there's not enough rain for a long time, and it makes it hard to grow food and find clean water. In Sindh, some parts of Baluchistan and Khyber Pakhtunkhwa are facing droughts making it difficult for farmers to grow crops, and many people don't have enough to eat.



- Females are often more vulnerable to extreme heat due to physiological differences. Pregnant females face additional risks during heatwaves. Dehydration and heat stress can harm both the mother and the developing fetus.
- In many societies, females are responsible for fetching water. As water scarcity increases due to climate change, girls and women spend more time collecting water, impacting their health and education.
- Limited access to clean water affects menstrual hygiene and overall well-being.
- Disasters force people to migrate. Females face specific challenges, including safety risks during displacement. Displaced females are vulnerable to exploitation, trafficking, and violence.
- Climate-related disasters damage schools and disrupt learning. Girls miss out on education during these closures.
- Early Marriage: When families face economic hardships due to climate impacts, girls may be married off early to reduce the family's burden.

**CLIMATE CHANGE
INCREASES FEMALE
HEALTH ISSUES**



INTRODUCTION TO ENVIRONMENTAL SUSTAINABILITY

Environmental sustainability means taking care of our planet so that it stays healthy for a long, long time. It's like being a good friend to Earth.

Imagine Earth as a big garden. We want to make sure this garden stays beautiful and full of life forever.

Now, think of our planet, Earth, like that shiny bicycle. Environmental sustainability means taking care of our planet so it can keep working and giving us all the things we need, like clean air to breathe, fresh water to drink, and beautiful nature to explore.

SUSTAINABLE DEVELOPMENT GOALS:

The Sustainable Development Goals, or SDGs for short, are a set of 17 global goals adopted by all United Nations Member States in 2015 and to be achieved by 2030.

- No Poverty: Make sure everyone has enough food, a safe place to live, and can go to school.
- Zero Hunger: Make sure everyone has enough healthy food to eat.
- Good Health and Well-being: Help people stay healthy, get medicine when they're sick, and live longer lives.
- Quality Education: Make sure all kids can go to school and learn important things to help them in life.



SUSTAINABLE DEVELOPMENT GOALS



- Gender Equality: Treat boys and girls equally and make sure everyone has the same opportunities.
- Clean Water and Sanitation: Make sure everyone has access to clean water to drink and clean toilets to use.
- Affordable and Clean Energy: Use energy from the sun, wind, and water that doesn't harm the environment.
- Decent Work and Economic Growth: Help people find jobs that pay well and treat them fairly.
- Industry, Innovation, and Infrastructure: Make sure everyone has access to good roads, internet, and technology to improve their lives.
- Reduced Inequality: Make sure everyone is treated fairly, no matter where they come from or what they look like.
- Sustainable Cities and Communities: Build cities where people can live safely, have clean air, and access parks and green spaces.
- Responsible Consumption and Production: Use less plastic and recycle more to help protect the environment.
- Climate Action: Stop climate change by using clean energy and protecting forests and oceans.
- Life Below Water: Protect oceans, rivers, and lakes, so fish and other sea creatures can live and grow.
- Life on Land: Protect forests and animals, so they have a safe place to live.
- Peace, Justice, and Strong Institutions: Make sure everyone is treated fairly by the law and can live in peace.
- Partnerships for the Goals: Work together with other countries to solve big problems like poverty and climate change.



ENVIRONMENTAL OWNERSHIP

Environmental ownership is about empowering students to protect the planet for the future by giving them the knowledge and skills to act. It's a movement that lays the groundwork for a sustainable world.



3 R'S CONCEPT

Reduce, Reuse, Recycle

- Use less
- Use again
- Recycle



shutterstock.com · 2404841229

WHY IS IT IMPORTANT TO TAKE CARE OF OUR PLANET?

- Clean Air and Water: Just like you need clean water to drink, animals need it too. Trash in rivers and lakes can make the water dirty for them .
- Protecting Future Generations
- Enjoying Nature: Taking care of the planet means we can keep having fun outside. But pollution can spoil it if we don't act.

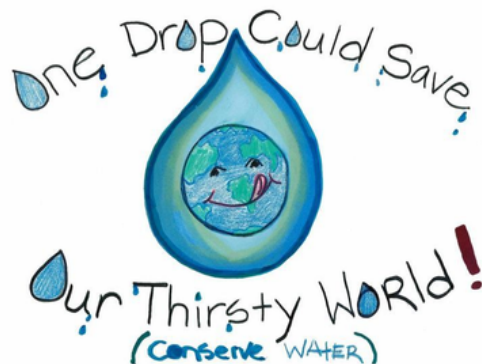




CONSERVING NATURAL RESOURCES

1. Water Conservation

Water is essential for life, but in Pakistan, many areas face water scarcity due to factors like low rainfall and inefficient use. It's important to conserve water to ensure there's enough for everyone, especially during dry seasons.



How can we use it wisely?



- Turn off the tap while brushing your teeth or washing your hands to save water.
- Fix leaking taps and pipes to prevent wastage.
- Use a bucket instead of a hose to water plants and wash cars.
- Collect rainwater for gardening or cleaning.





How can we save energy at home and at school?

Turn off lights and fans when leaving a room.

Use energy-efficient LED bulbs instead of traditional bulbs.

Unplug chargers and appliances when not in use to avoid standby power consumption.

Use natural light during the day instead of turning on lights.

Encourage schools to switch to solar panels for electricity generation.

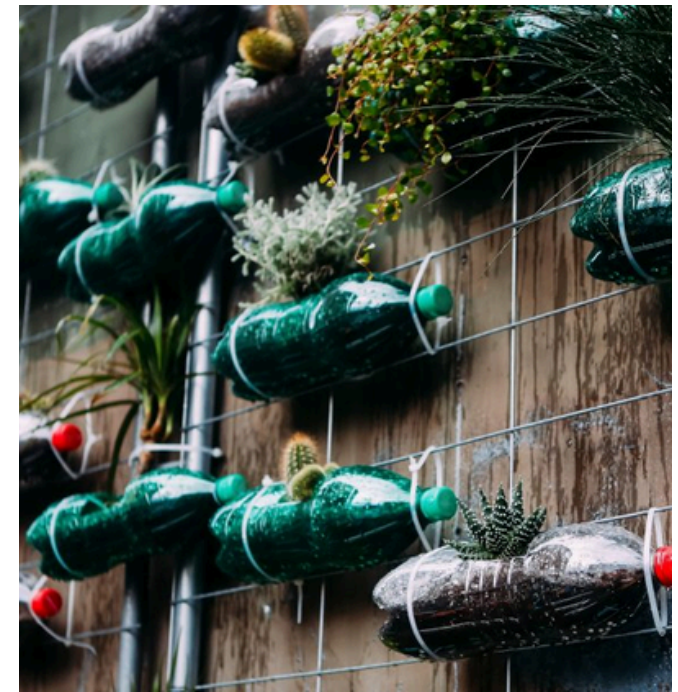
2. Energy Conservation

Energy conservation refers to the practice of reducing the consumption of energy resources to minimize waste and preserve natural resources for future generations. It involves making conscious choices to use energy more efficiently and wisely in our daily lives.



3. Recycling

Recycling helps reduce waste, conserve resources, and protect the environment. In Pakistan, improper waste disposal leads to pollution of rivers, soil, and air, affecting human health and ecosystems.



How can we reduce waste?

1. Sort household waste into separate bins for recycling materials like paper, plastic, glass, and metal.
2. Reuse items like plastic bottles, containers, and bags instead of throwing them away.
3. Compost organic waste like fruit and vegetable scraps to create nutrient-rich soil for gardening.
4. Encourage schools to implement recycling programs and educate students about the importance of recycling.

Teacher Role in Climate Education and Student Leadership



Kids today are facing a world filled with new challenges, like climate change. How we teach them about these issues is just as important as what we teach. Using real-life examples and hands-on learning by teachers can make a big difference in getting them engaged.

Cambridge's research review, the Great Teaching Toolkit outlines four elements of a model for effective teaching which is essential in climate education.

- Great teachers understand the content they are teaching and how it is learned.
- Great teachers create a supportive environment for learning.
- Great teachers manage the classroom to maximize the opportunity to learn.
- Great teachers present content, activities, and interactions that activate their students' thinking.

This chapter provides activities and initiatives for teachers they can implement in their classrooms to teach climate education in an interesting and fun way.

1. In the Ice Cube Experiment, students can use basic materials like containers, water, and ice cubes to simulate the effects of global warming on Earth's ice caps. By observing melting ice cubes in containers with added pollutants, they learn about climate change's impact on glaciers, sea levels, and ecosystems. This hands-on activity helps students grasp the greenhouse effect and the need for action.

2. Understanding the Greenhouse Effect:

In this activity, students build mini greenhouses to explore the greenhouse effect. Using plastic bottles, soil, and plants, they create ecosystems to observe how certain gases trap heat. By monitoring temperature changes, students learn about the greenhouse effect's role in climate change and develop scientific understanding and environmental awareness.



Climate Change Awareness through Social Media Initiative

Empathy Building Workshop in Classroom

1. Video Presentation

- Show short videos featuring personal stories of individuals impacted by climate change. Encourage students to focus on the emotions, struggles, and resilience portrayed.

2. Group Discussion:

- Facilitate the sharing of reactions and insights from the videos.
- Prompt students to reflect on challenges faced by those affected and imagine themselves in similar situations.

3. Reflection and Action Planning:

- Guide students in reflecting on their emotions and insights.
- Encourage them to brainstorm actionable ways to support those affected by climate change.
- Discuss the significance of collective action in addressing climate challenges.

Objective: Create dedicated social media platforms for schools to raise climate change awareness and showcase student-led initiatives.

Platform Setup:

- Principals and teachers establish accounts on Facebook, Instagram, and YouTube.
- Teachers oversee content and engagement.
- Students create climate change-related artwork, campaigns, and projects, credited on school's social media platforms.

Peer Group Learning:

Climate Education Peer Mentorship Initiative: Cultivating Leadership and Collaboration

Objective: Advance leadership skills and collaboration among students through a peer mentorship program focused on climate education.

Setup:

- Older students mentor younger peers on climate change awareness and action.
- Mentors selected from upper grades, and mentees from lower grades for diverse perspectives.
- Mentors receive training on mentorship techniques and climate change topics from teachers.
- Weekly meetings facilitated by teachers to assess progress.

Spotlight on Student Actions: Community Partnerships for Climate Change Solutions

- Session on "Climate Change and its Impact on Girls' Education," in collaboration with Climate Class Connection (CCC), and the dynamic Ms. Zainab Zahid, a young environmental scientist who repped Pakistan at COP28.



- Students from Miss Sehrish's Classroom (IMSG Badia Qadir Buksh) are advocating about climate change and its link with social cohesion and peace at Quaid-e-Azam University.



- Highlights from dialogue organized by students on climate change



- In collaboration with the City Development Authority (CDA), a mechanism has been established to collect garbage from schools on a weekly basis





- From Classroom to Community: Student-Driven Initiatives Making a Difference



Principal's Interview

Why is it important for our school to address climate change in the curriculum?

In my opinion, integrating climate change into the school curriculum is essential for fulfilling our educational needs, ensuring real-world relevance, promoting interdisciplinary learning, preparing students for the future, and upholding ethical imperatives. As a principal, I foresee it as a moral and educational imperative to address this critical issue in our school curriculum. Schools play a crucial role in educating future generations. By integrating climate change into the curriculum, students gain a comprehensive understanding of the issue, its causes, impacts, and potential solutions. This empowers them to become informed global citizens capable of making positive contributions to society.

How can we ensure that students understand the relevance and urgency of climate change?

To ensure that students understand the relevance and urgency of climate change, as a principal I have taken different steps and formed students WASH clubs, green team, and School safety committee where students can explore climate-related issues, plan initiatives, and lead awareness campaigns to encounter the sudden incidents, within the school and beyond. Teachers are playing their role as a facilitator. Teachers facilitate this process, guiding students in planning and executing initiatives. Providing hands-on learning experiences and environmental projects helps students directly observe climate change impacts, reinforcing education and inspiring action. Recognizing and celebrating student achievements in climate change education through public exhibitions and events like Parent-Teacher Meetings highlights their efforts, motivating further involvement and positive change.

What strategies can be implemented to ensure that climate change education becomes a sustained priority in the school curriculum in low-income communities?

It should be emphasized to Embed climate change education in National curriculum, across various subjects, including science, social studies, languages, and mathematics. Professional development opportunities for teachers, focused on climate change education can be a good strategy .Training sessions, workshops, and resources can equip teachers with the knowledge, skills, and teaching strategies needed to effectively integrate climate change topics into their lessons and engage students who belong from diverse backgrounds. To Empower students can be a great opportunity for boosting their skills as leaders in climate change education and advocacy within their schools and communities. So as a principal, I will focus on student-led initiatives, WASH clubs, and projects focused on environmental sustainability, activism, and civic engagement so that students of my institution can be a responsible citizens. I will also Develop long-term sustainability plan for climate change education programs, incorporating strategies for ongoing evaluation, improvement, and institutionalization within the school system. As personally I think “Follow up” is very important for the sustainability of any program. By implementing these strategies , climate change education can become a sustained priority in the school curriculum in low income communities.

Ms. Sumaira Liaqat
IMSG, BADIA QADIR BUKSH

Guide for Parents

مل کر تلویزن پر دلچسپ ویڈیوز اور دستاویزات دیکھیں جو ماحول کی تبدیلی اور ماحول کے بارے میں ہوں۔ اپنے بچوں کے ساتھ دیکھنے کے بعد ان چیزوں پر گفتگو کریں۔

والدین کو گذشتہ کے واقعات سنانے چاہئیں، موسم کی تبدیلیوں کی کہانی بیان کریں اور بچوں کو ان تبدیلیوں کی معلومات دیں۔

بچوں کو جانوروں اور پودوں کو دیکھنے کیلئے طبیعتی سیر پر لے جائیں، حیاتی نظام کی اہمیت پر گفتگو کریں اور ماحولیاتی تبدیلیوں کے اثرات کی بات کریں۔

بچوں کو موبائل پر ماحولیات کھیلوں کو کھیلنے کی ترغیب دیں۔

اپنے بچوں کو اسکول میں ماحولیاتی تبدیلی کے سرگرمیوں میں شرکت کرنے کی ترغیب دیں

بچوں کو یہ سکھائیں کہ پودوں اور جانوروں کا احترام کرنا کتنی اہمیت رکھتا ہے۔

اپنے گھر میں ایک چھوٹے سے باغ شروع کریں۔

بچوں کو بتائیں کہ پودوں کی آکسیجن اور کاربن ڈائی آکسائیڈ جذب کرنے میں کتنی اہمیت ہے اور خود کی کھانے کی پیداوار کرنے کے فوائد کیا ہیں۔

بچوں کو ری سائیکل کرنے کے طریقے سکھائیں اور انہیں زندگی میں پانی اور بجلی کی محفوظ کرنے کی ترغیب دیں۔

ہمیشہ اپنے بچوں کو ماحول کے بارے میں سوالات کرنے اور ان کے ساتھ معلوماتی بحث کرنے کی حوصلہ افزائی

Additional Resources

Recommended books, websites, and organizations for further learning and support. For teachers and students from grades 4 to 9 looking to expand their knowledge on climate education, here are some recommended resources:

Books

- “The Magic School Bus and the Climate Challenge” by Joanna Cole and Bruce Degen
- “Climate Change: Discover How It Impacts Spaceship Earth” by Joshua Sneideman and Erin Twamley
- “Our House Is On Fire: Greta Thunberg’s Call to Save the Planet” by Jeanette Winter

Organizations

- [Children and youth call for access to quality climate education | UNICEF](#): Advocates for quality climate education for children and supports teachers in this field.
- [Climate Education Charity for Children and Youth - The ChariTree Foundation\(charities-foundation.org\)](#): Focuses on environmental education for children and youth, offering programs that help develop environmental literacy and outdoor life skills.
- [Climate change education | UNESCO](#): Provides resources and support for climate change education and helps implement a whole-school approach to climate action

[Climate change resources for schools | WWF](#): Provides a range of curriculum-linked resources for the classroom to help students explore the issues of climate change engagingly.

Websites

- [A Guide to Climate Change for Kids | NASA Climate Kids](#): Offers a variety of resources including lesson plans, activities, and games that cover topics like the water cycle, climate change, and agricultural systems.
- [Climate Change Lesson Plans | Edutopia](#): Features lesson plans, videos, articles, and infographics to help students understand climate change in the context of global developments

“Global warming is not a prediction, It is happening”

James Hansen



REFERENCES

1. Atlantic Council. (2023). Empowering Pakistan's Youth to Address Climate Change Risks. Retrieved from <https://www.atlanticcouncil.org/in-depth-research-reports/issue-brief/empowering-pakistans-youth-to-address-climate-change-risks/>
2. World Bank. (2022). Climate Change Knowledge Portal: Pakistan. Retrieved from <https://climateknowledgeportal.worldbank.org/country/pakistan/vulnerability>
3. UNDP. (2023). Environment and Climate Change: Pakistan. Retrieved from <https://www.undp.org/pakistan/environment-and-climate-change>
4. The Key. (n.d.). Education and Climate Change. Their world. Retrieved January 31, 2024, from <https://key.theirworld.org/resources/climate-change>
5. ReliefWeb. (2023). Climate Impacts on Education and Learning Losses in the Provinces of Sindh. Retrieved from <https://reliefweb.int/report/pakistan/climate-impacts-education-and-learning-losses-provinces-sindh>
6. USIP. (2022). Pakistan's Climate Challenges Pose a National Security Emergency. Retrieved from <https://www.usip.org/publications/2022/07/pakistans-climate-challenges-pose-national-security-emergency>
7. <https://climatekids.nasa.gov/weather-climate/>
8. <https://www.unicef.org/lac/en/toolkit-young-climate-activists>
9. How magnetism and granulometry of continental margin sediments reflect terrestrial and marine environments of South America and West Africa - Scientific Figure on ResearchGate. Available from: https://www.researchgate.net/figure/The-Earths-interacting-subsystems-Lithosphere-hydrosphere-cryosphere-atmosphere_fig1_279400330 [accessed 3 May 2024]
10. <https://www.geeksforgeeks.org/what-is-the-greenhouse-effect/#what-are-greenhouse-gases>
11. Pakistan Floods: Education Snapshot - 30 September 2022 - Pakistan | ReliefWeb
12. How is climate change having an impact on girls' education? | World Economic Forum (weforum.org)
13. Photos: Concerns as Pakistan glaciers melt | Climate Crisis News | Al Jazeera
14. Climate crisis has severe impact on girls' education - report | Plan International (plan-international.org)
15. <https://www.cambridgeinternational.org/why-choose-us/benefits-of-a-cambridge-education/climate-change-education/>
16. Cambridge International Education. (n.d.). Great teaching toolkit: Evidence review. Retrieved January 31, 2024, from <https://www.cambridgeinternational.org/support-and-training-for-schools/teaching-cambridge-at-your-school/great-teaching-toolkit>.