

COOL Strategies Instructions and Answers for Teachers

- Venue: Cloud Forest (indoor)
- Estimated duration to complete all questions: 1 hr

Level / Subject:

- Lower Secondary (Science): Interactions within Ecosystems
- Lower and Upper Secondary, Normal Technical (Science): Discovering Energy; Sources of Electricity
- Lower Secondary (Geography): Managing the Changing Environment

Learning Objectives:

- Evaluate the impact of human activities on the environment
- Explain the importance of conserving the environment
- Learn about measures to reduce the impact of global warming
- Appreciate the need to use energy responsibly



ACTIVITY 1: MAN'S IMPACT ON THE ENVIRONMENT (10 min)

Explore Cloud Forest Gallery at the Cloud Forest to learn about the impact of human activities on the environment.

The Earth's surface temperature has increased over the years due to global warming. What are the human-induced causes of global warming? List them here.

Answers:

Burning of fossil fuels in industries, for powering vehicles or for generating electricity;
Methane released from extensive agriculture;
Deforestation for large-scale commercial agriculture, urban development, or to obtain timber in an unsustainable manner.

ACTIVITY 2: HEATING UP (20 min)

The temperature of the Earth's surface is higher than it was before global industrialisation in the 1800s. This phenomenon is generally attributed to the greenhouse effect caused by increased levels of greenhouse gases e.g. carbon dioxide, methane and other pollutants. Scientists predict that if nothing is done, the planet's global and surface temperature may be between 2.5 and 4.7 degrees Celsius higher than the pre-industrial period, by 2100.

Why is it important to stop global warming? Explain these in the space here.

Answers:

A rise in the average temperature of the Earth's climate will cause the melting of polar ice caps and glaciers, which in turn will cause a rise in sea levels. Such changes mean that natural habitats will be affected, resulting in a shift in the balance of flora and fauna populations around the world. Islands and coastal areas in particular will suffer.

There will also be extreme changes in the weather, since the amount of water found in the atmosphere has changed. Certain areas will become wetter, with more flash floods, or experience longer, colder winters. Hot and dry areas will experience heatwaves, more incidents of drought, and hotter and drier summers with more wildfires.

Higher levels of carbon dioxide make the oceans too acidic. Marine species that are not able to survive the environmental changes will die, and impact the entire ecosystem, threatening the future of people and nature.

ACTIVITY 3: STAYING IN BALANCE (10 min)

To play our part in maintaining a balance with nature and reducing the impact of global warming, Gardens by the Bay uses sustainable energy and practices. Proceed to watch the animation and illustration of the Gardens' sustainability strategies at Cloud Forest Theatre, to find out more.

ACTIVITY 4: BEAT THE HEAT (20 min)

The need to put in place measures to stop global warming and conserve the environment is the shared responsibility of every individual and nation.

What would you do to be a responsible citizen of the environment? Design your own green home or lifestyle, with its sustainable practices, in the space provided.

Answers:

Students may write or draw their green home or lifestyle in the space provided.

Possible answers:

Use energy efficient light bulbs and other home appliances;

Have different bins to sort and recycle bottles, cans, paper, plastic, etc.;

Open windows for natural breeze and use fans instead of an air-conditioner;

Turn off power when not in use;

Use recycled paper and repurposed old bottles, clothes and even furniture;

Give away old books and clothes instead of throwing them away;
Bring and use reusable cloth bags when shopping;
Bring your own tumbler, thermal food containers and cutlery for takeaway meals;
Do not waste food;
Use a clothes line instead of a dryer;
Install photovoltaic panels at home;
Install a solar water heater;
Walk / use a bike / public transport;
Go outdoors to play sports instead of watching television or playing computer games;
Learn more about global warming and educate family and friends.

Given above is an example of possible answers. Other answers are acceptable if students provide well-thought out reasoning. Teachers may also share plausible answers for the purpose of general knowledge.

Actions speak louder than words. Make a personal commitment to live out these sustainable practices!

Notes to Teacher:

For more on Man's impact on the environment and the environmental sustainable strategies at the Gardens, check out these Secondary School programmes:

- Gardens Under Glass,
 - The COOL Factor,
 - Home Today, Gone Tomorrow,
 - Renewed Energy,
- Please refer to our website for more details.