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DepEd MEMORANDUM
No. **483** , s. 2010

2010 OBSERVANCE OF CLIMATE CHANGE CONSCIOUSNESS WEEK

To: Undersecretaries
Assistant Secretaries
Bureau Directors
Regional Directors
Schools Division/City Superintendents
Heads, Public and Private Elementary and Secondary Schools

1. The Department of Education (DepEd), in collaboration with the Climate Change Commission will observe the **Climate Change Consciousness Week** with the theme, "*Nagbabagong Klima'y Labanan, Pagkakaisa'y Kabayanihan*" on November 19-25, 2010. This is pursuant to Republic Act No. 9729 (Climate Change Act of 2010) and Presidential Proclamation No. 1667, declaring November 19-25, 2008 and every year thereafter as "Global Warming and Climate Change Consciousness Week."
2. The observance aims to undertake activities to enhance awareness and consciousness on Climate Change focus on mitigation and adaptation. Please see suggested activities in the Enclosure No. 1.
3. The school heads are expected to lead in the different activities with the assistance of the different department heads, area coordinators and CAT facilitators. It is also suggested that the Parent Teacher Association (PTA) officers and members shall be involved in the suggested activities appropriate for them, for they shall also be made aware of the Climate Change nature and impact.
4. A culminating program shall be held on the last day of the celebration. The highlights of the program shall be the awarding of prizes/certificates to school level contest winners, a talk or message on the theme and special numbers to be prepared by the MAPEH Department depicting the theme of the celebration.



5. The schools division/city superintendent through the designated division focal persons on Environmental Education, Disaster Risk Reduction (DRR) and Climate Change shall monitor the school level activities and shall report to the respective Regional Directors, Attention: Regional Focal Person.
6. Enclosure No. 2 contains a copy of the Model Lesson Exemplar on Climate Change approved by IMCS (lesson plans for each grade and year level shall be prepared by the master teachers/department heads of Science and *Araling Panlipunan* in the secondary and MTs in the elementary level. The Orientation/Reading Materials from Philippine Atmospheric, Geophysical and Astronomical Services Administration (PAGASA) will be e-mailed to the regions by the National Commission for Culture and the Arts (NCCA).
7. For more information, please contact the Office of Undersecretary for Regional Operations at telephone no.: (02) 633-72-03
8. Immediate and wide dissemination of this Memorandum is desired.


BR. ARMIN A. LUISTRO FSC
Secretary

Encls.:

As stated

Reference:

None

To be indicated in the Perpetual Index
under the following subjects:

CELEBRATIONS & FESTIVALS
ENVIRONMENTAL EDUCATION
SCHOOLS

(Enclosure No. 1 to DepEd Memorandum No. 483, s. 2010)

SUGGESTED SCHOOL LEVEL ACTIVITIES

November 19, 2010, Friday

- Campus Launching: March around the campus , organized by Student Government Organization with the participation of the Classroom Organization Officers with placards on Climate Change slogans depicting the theme and made of recycled /indigenous materials.
- Announcement of various school level contests like: Drawing, jingle, making, poster making, essay writing, tula making and others. Mechanics shall also be announced during this activity and the expected activities for the week.

November 19, 2010, Saturday (with parent involvement and or consent)

- Operation Linis- Ganda ng Paaralan
- Waste Segregation
- Tree Planting (Malunggay etc)
- Others

November 21 - 22, 2010, Monday and or Tuesday

- Information sharing on the attached materials from PAGASA .Homeroom Guidance Period may be utilized for this activity.
- Teachers of English and Filipino may facilitate the conduct of an essay writing contest depicting the theme. Winning entries shall be published in the School's Campus Paper/Organ

November 23-24, 2010, Wednesday and or Thursday

- Curriculum Integration in Araling Panlipunan and Science I-IV and Science (Gr. 3-6 and HEKASI (Gr 1-6) only. The enclosed model Exemplar approved by IMCS shall be used as basis for the preparation of a day lesson plan suited to the grade/year level.
Note: Master Teachers and or Department Heads are requested to prepare a uniform lesson plan and to be approved by the School Head.

November 25, 2010, Thursday

- Culminating Program to be highlighted by a Talk of a Resource Person on the theme and special numbers to be prepared by the MAPEH Department;
- Announcement and awarding of prizes or certificates only

Note:

- Parents may be invited to attend this activity for they also need correct information on Climate Change.
- School Head may decide to hold the culminating program on Friday

GLOBAL WARMING AND CLIMATE CHANGE

What do you know about

- greenhouse effect and global warming
- climate change
- causes of global warming and climate change
- effects of global warming

Introduction

Global Warming

The atmosphere is composed of a mass of gases that surrounds the earth. There are three levels of atmosphere closest to the earth: the troposphere, the stratosphere, and the mesosphere. In the stratosphere, a thin layer of ozone is present. This layer is important as it protects the earth from the harmful rays (ultraviolet rays) of the sun.

Solar energy, experienced as sunlight, passes through the atmosphere in the form of relatively short-wave energy. Some of this energy is absorbed by the earth while others are reflected back into space. But as the short-wave energy heats up the earth's surface, it radiates back in the form of longer-wave energy. This form of energy is gobbled up naturally by greenhouse gases, trapping heat in the earth's atmosphere.

THE GREENHOUSE EFFECT

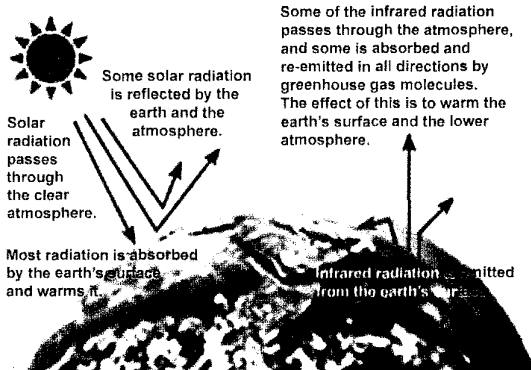


Figure 1

Similar to the effect of a greenhouse, the earth is warmed up because of the trapped heat, resulting in an increase in the earth's temperature. The accumulated gases in the atmosphere are called "greenhouse gases" while the increase in temperature is known as the "greenhouse effect." The greenhouse effect is a natural phenomenon. It balances and regulates the world's temperature and makes life possible on earth.

However, growing amounts of gases have reduced the efficiency of the greenhouse effect. Between 1950 and 2000, global carbon dioxide emissions went up from one billion metric tons to more than seven billion metric tons -- a 600% increase in the space of a half-century. This is largely the result of the continuous burning of fuels for energy, mostly gasoline for transportation and coal for electricity (OPACC, 2009).

Trapped in the earth's atmosphere, these gases have been accumulating over the past two centuries. Today, this vast and dramatic accumulation is upsetting the balancing function of the greenhouse effect. As a result, the world is becoming dangerously hot, resulting in a phenomenon called global warming. Global warming leads to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans.

Climate Change

Climate is the long-term average weather condition in a given place. Any long-term significant change in weather patterns such as changes in temperature, precipitation, wind, and humidity is called climate change.

Climate change (IPCC, 2009) is caused by the warming of the globe due to the extensive use of hydrocarbon fuels. These are basically coal, oil, and natural gas. The burning or use of these fuels results in carbon dioxide (CO₂) emissions.

Other greenhouse gases (GHG) that contribute to climate change are: methane, produced by waste and garbage; nitrous oxide from chemical fertilizers and animal manure; fluorinated greenhouse gases (or F-gases), which are man-made gases composed of sulfur hexafluoride (SF₆) and halocarbons such as chlorofluorocarbons (CFCs).

Objectives

General Objectives

- To introduce to the students the impact of greenhouse gases (GHG) and their relation to global warming and the threat of climate change
- To understand the risk caused by climate change and how it can be reduced through awareness and preparation

Specific Objectives

At the end of the lesson, students shall be able to:

- discuss what causes global warming, including adverse effects on human beings.
- identify greenhouse effect.
- identify ways to reduce the risk caused by climate change.

Main Ideas

- Global warming is a worldwide phenomenon that concerns all of us.
- Climate change needs serious concrete and specific actions in order to reduce its risks to humans, plants, and animals.
- All of us can do something about climate change.

Vocabulary

1. climate change – any long-term significant change in the average weather that a given region experiences such as temperature, precipitation, wind, and humidity.
2. global warming – an increase in the average temperature of the earth's near-surface air and ocean as a result of the increased concentration of greenhouse gases in the atmosphere.
3. greenhouse effect – a natural phenomenon that balances and regulates the world's temperature and makes life possible on earth.

4. solar radiation – solar energy that passes through the atmosphere in the form of light waves.
5. fluorinated greenhouse gases (F-gases) – man-made gases composed of sulfur hexafluoride (SF_6) and the families of gases known as hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs). F-gases are powerful greenhouse gases with global warming potentials many times that of natural greenhouse gases such as carbon dioxide. They also tend to remain much longer in the atmosphere than natural greenhouse gases. (<http://www.environ.ie/en/>, access, 2009)
6. carbon dioxide (CO_2) – a chemical compound composed of two oxygen atoms covalently bonded to a single carbon atom. It is a gas at standard temperature and pressure and exists in the earth's atmosphere in this state.

Carbon dioxide is used by plants during photosynthesis to make sugars which may either be consumed again in respiration or used as the raw material to produce polysaccharides such as starch and cellulose, proteins, and a wide variety of other organic compounds required for plant growth and development. It is produced during respiration by plants, animals, fungi, and microorganisms that depend on living and decaying plants for food, either directly or indirectly. It is, therefore, a major component of the carbon cycle. Carbon dioxide is generated as a by-product of the combustion of fossil fuels or the burning of vegetable matter, among other chemical processes. Large amounts of carbon dioxide are emitted from volcanoes and other geothermal processes, such as hot springs and geysers and by the dissolution of carbonates in crustal rocks.

7. methane (CH_4) – the simplest alkane and the principal component of natural gas. Burning methane in the presence of oxygen produces carbon dioxide and water. The relative abundance of methane and its clean burning process makes it a very attractive fuel. However, because it is a gas at normal temperature and pressure, methane is difficult to transport from its source.
8. nitrous oxide (N_2O) – at room temperature, a colorless non-flammable gas, with a pleasant, slightly sweet odor and taste. It is used in surgery and dentistry for its anesthetic and analgesic effects. It is known as “laughing gas” due to the euphoric effects of inhaling it, a property that has led to its recreational use as an inhalant drug. It is also used as an oxidizer in rocketry and in motor racing to increase the power output of engines.

Nitrous oxide reacts with ozone and is the main naturally occurring regulator of stratospheric ozone. Nitrous oxide is also a major greenhouse gas. Considered over a 100 year period, it has 298 times more impact per unit weight than carbon dioxide.

Subject Matter

Global Warming and Climate Change

References

<http://www.environ.ie/en/>, access 2009

Creeping Climate Change, Office of the Presidential Adviser on Global Warming and Climate Change, 2009

The Economics of Climate Change in Southeast Asia: A Regional Review (Sir Nicholas Stern-led UK-funded ADB Study), 2009
Inter-agency IEC materials on Climate Change, 2008-2009
Executive Order 774, 2008: Executive Order 785, 2009
Civil Service Memorandum on Earth day, Ocean and Environment Month, 2008
IPCC Report on Climate Change, 2007

Strategy

Motivation

Students are asked about their observations on weather changes in their community. This means experience of sudden changes of hot and cold weather at extreme rate of temperatures. Students share their observations and experiences in class.

Activity 1

On a sunny day, bring students outside of the classroom. Give them time to observe the sky and the outdoors. Let them check the temperature using a thermometer. Give students time to record their observations. (Teachers can also use this as a one week/one month experiment. Graph daily temperature and analyze at the end of the period.)

Guide Questions:

1. How did you feel while you were out observing the sky?
2. What can you say about the changing temperature in your locality?
3. How would you describe the quality of the air?
4. Try to remember a time when you were in the province. Do you see any difference or similarity in the condition of the atmosphere in the cities and in the provinces? Compare and contrast.

Activity 2

Divide the class into four groups. Assign one of the following topics to each group.

1. Burning of garbage and plastic
2. Uncontrolled emission of gas from vehicles
3. Emission from factories
4. Burning of fossil fuel

Brainstorm on its impact in the environment. Let the group report to the class the result of their discussion.

Analysis

1. What are the effects of pollution on our environment?
2. Describe the connection between the temperature, quality of air, and the smoke emitted into the air.
3. Explain the "greenhouse effect."
4. How can we minimize the adverse effects of global warming?

Abstraction

Climate change and global warming are basically the result of human activities. Risk can be reduced by doing concrete and specific actions in the school, home, or even in the larger community.

Question:

What possible things can ordinary people do to protect the environment?

Application

Provide specific examples on what you can do in the school, home, or even in the larger community to help minimize the accumulation of greenhouse gas in the earth's atmosphere.

Things you can do to minimize Greenhouse Effect: (Ten earth saving tips by OPACC)

- Change your incandescent light bulbs to compact fluorescent lamp. The cumulative effect is enormous. Turn off unneeded lights. Bring natural sunlight into your home when it is feasible.
- Buy green energy and invest in green stocks. Encourage use of electricity from renewable sources, solar panels, geothermal and wind power sources. Buy "green power." Invest in renewable energy companies.
- Tune up your car if it is a gas guzzler. Better walk, bike, or use public transportation.
- Plant trees. Water lawn sparingly or use recycled water to conserve energy.
- Your house should not be too hot nor too cold! Clean vents, close unused vents, and change filters in the vents. Ceiling fans reduce cooling costs by more than half.
- Use green charcoal, a Philippine substitute to charcoal from burnt wood.
- Tame the refrigerator energy appetite! Do not set the thermostat too high. Even one degree makes a difference.
- Buy recycled; help create a market. Before you buy, check to see if the product or its packaging is recyclable.
- Big users of energy are hot water heater, washer and dryer, and dishwasher.
- Buy less, use less. Re-use in creative ways.

How can you share the knowledge learned in this lesson with your family and friends?

Evaluation

Explain how the following greenhouse gases enter the atmosphere because of human activities:

1. carbon dioxide
2. methane
3. nitrous oxide
4. fluorinated gases

Closure

Life skills learned:

- It is the responsibility of each individual to protect and save the environment.

Concepts

- Recall why there is climate change.
- List down the causes of global warming.
- Define climate change.

Critical Thinking

- Evaluate how the government is implementing the "Clean Air Act."
- Explain the greenhouse effect.
- State your commitment to save and protect the environment.