CLIMATE LITERACY

A PRIMARY MOVE TO EXPAND THE FRONTIERS OF CLIMATE EDUCATION

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PREFACE

Rapid urban development and population growth in the tropical regions demonstrated an inextricable change from the natural environment which has brought about many environmental and health challenges at various scales, particularly in the form of changing climates. Malaysia is not exempted from experiencing a significant urban development that exacerbate the local climate to cause devastating environmental disasters such as flash flood, torrential rain, heat waves, chronic water shortages and even rare episodes of hail storms. However, unprecedented exploitation towards the environment and natural resources is still rampant in various economic sectors due to the lack of proper knowledge and awareness of the cascading effects of climate change. This calls for an immediate action to inculcate a proper knowledge on climate change to foster the contemporary society towards environmental stewardship and sustainability practices. Importantly, such moves should be started from the children as they are going to create the future stakeholder society that is going to devise various development activities and utilize natural resources to meet the future human needs without undermining the stability and integrity of the natural ecosystems.

One such effort is the creation of ‘Climate Literacy: A Primary Move to Expand the Frontiers of Climate Education’ booklet as a first move to raise the knowledge and awareness of the Malaysian secondary school children towards the climate change issues. The booklet is designed as a part of the University of Malaya’s Grand Challenge project (GC002A-15SUS) issued under the Sustainability Science Cluster. The main goal of the booklet is to expose the secondary school children towards some fundamental topics of climate change issues and potential impacts to strengthen their capacity for appropriate response strategies. This booklet is organized as a narration for an easy assimilation by the students. Besides, some additional scientific facts ( ) which are related to the topic of discussion are provided in the margins of respective sections to revamp the general knowledge of the students. At the same time, some exercises in the ‘Try It Out’ section are provided for the students to self-assess their understanding about the topics. This booklet is expected to play role as an initial step to stimulate the youngsters to work towards minimizing elevating global temperature compared to preindustrial levels in response to Malaysia’s pledge made in the Paris Summit in 2015. Furthermore, the commitment and active participation of children as the future stakeholders in tackling climate change issues are basic prerequisites for Malaysia to create world-class sustainable and climate-friendly cities in the future.

Last but not least, the authors would like to take this golden opportunity to extend their gratitude to all the parties who have made valuable contributions in creating this booklet successfully.
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INTRODUCTION

What Do You Know?

We are often bombarded with the word ‘climate change’ from various sources such as books, television, newspapers and internet. Have you ever wondered what climate change is all about? Before proceed further with our story, let’s undertake a short quiz to unravel your understanding about the issues of climate change! Good Luck!

1. Do you think that climate change is really happening?
   - Yes
   - No
   - Don’t Know

2. Do you think that climate change affects human health?
   - Yes
   - No
   - Don’t Know

3. Do you think that climate change affects the environment?
   - Yes
   - No
   - Don’t Know

4. Do you feel that the surrounding environment is getting hotter?
   - Yes
   - No
   - Don’t Know

5. Have you observed that it rains heavily and more frequently recently?
   - Yes
   - No
   - Don’t Know

6. Do you realize that Malaysia is facing frequent flash flood issues recently?
   - Yes
   - No
   - Don’t Know

7. Have you heard that many countries are facing depleting water resources recently?
   - Yes
   - No
   - Don’t Know

8. Do you aware of melting of polar ice and rising sea levels?
   - Yes
   - No
   - Don’t Know

9. Do you know that increasing temperatures can lead to extended drought conditions?
   - Yes
   - No
   - Don’t Know

10. Do you know that increasing temperatures can result in crop production loss?
    - Yes
    - No
    - Don’t Know
If you answered all the questions with ‘YES’, then you are aware of climate change and its impacts. A fundamental knowledge about the earth’s climate and the associated issues is always a prerequisite to understand the problems related to climate change.

Do you know that increasing global temperatures, melting glaciers, rising sea levels, torrential rains, flash floods and frequent heat waves are some of the visible evidences to know that our earth’s climate is actually changing!

Climate change can occur due to both natural and man-made causes. Sometimes, climate change occur as the result of the changes in the Earth’s orbit due to astronomical variations. These orbital variations are known as ‘Milankovitch cycles’ that impose strong implications on the Earth’s planetary atmospheres. Figure 2 shows the Milankovitch cycles which are divided into eccentricity, obliquity and precession that influence the amount of solar radiation reaching the Earth. This phenomenon is believed to strongly influence the climatic patterns on the Earth.

Figure 1 Climate change: deteriorating health of earth

Figure 2 Milankovitch cycles: (a) Eccentricity (b) Obliquity (c) Precession
However, anthropogenic activities such as urban development, fuel combustion, deforestation, agriculture and transportation activities that release huge amount of greenhouse gases into the atmosphere can also significantly contribute to climate change\textsuperscript{14}. Currently, this is the greatest concern of climatologist as such human activities may increase the rate of climate change that can seriously affect both human and environmental health. Before proceed further with this topic, it is vital to learn some climate-specific terminologies for a better apprehension of the upcoming sections of this booklet.

**TRY IT OUT 1!**

**Instruction: State ‘True’ or ‘False’ for the following statements.**

i. Raining on 17\textsuperscript{th} January 2018 is an example of climate change (True / False)

ii. Climate change is referring to gradual warming of the Earth only (True / False)

iii. Climate change can be caused by both natural and man-made factors (True / False)

iv. Eccentricity cycles are the examples of man-made causes of climate change (True / False)

v. It was believed that Milankovitch cycles played a key role for the ice age (True / False)