

SCIENCE GRADE 7

MODULE 4: EARTH AND SPACE

Lesson 1: The Philippine Environment; Interactions in the Atmosphere

INTRODUCTION AND FOCUS QUESTION(S):

Have you ever wondered why various places in our country have different means of living and lifestyle? For example, the people of Benguet and Baguio, aside from enjoying a cooler weather, rely greatly on their region's bountiful harvest of flowers and vegetables. They even celebrate it. Romblon boasts of its quality marble and marble products. On the other hand, people of Polilo Island, a place frequently visited by typhoons, struggle to progress despite their bountiful sea harvest. Why is this so? What calls for the difference among how people live on these places?

Man in past has abandoned its nomadic way of life and has chosen to settle down at certain locations. His immediate environment has shaped the way he lives and how he develops. It is not possible, therefore, that man can live separately with his environment. In this module, you will find out **How does where we live influence the way we live and how does location determine the growth of particular area?** Remember to search for the answer to these questions as we move along this module.

LESSONS AND COVERAGE:

In this module, you will examine these questions when you take the following lessons:

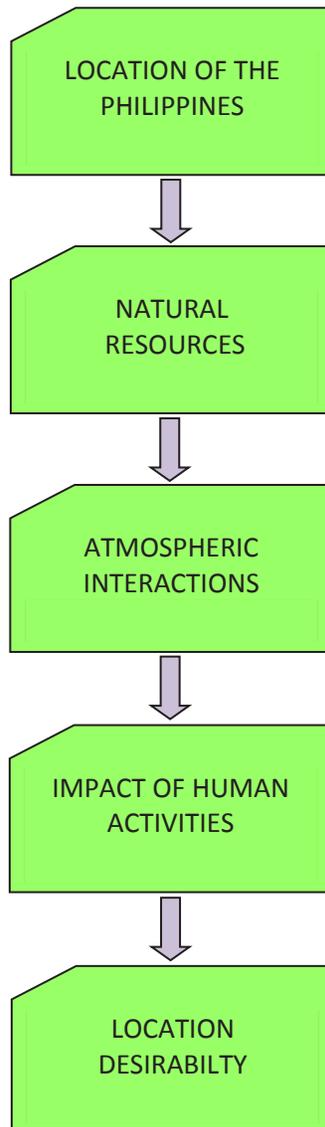
Lesson 1 – The Philippine Environment

Lesson 2 – Interactions in the Atmosphere

In these lessons, you will learn the following:

Lesson 1	<ul style="list-style-type: none">• demonstrates how places on Earth may be located using a coordinate system• relate the location of the Philippines with respect to the continents and oceans of the world• recognizes that soil, water, rocks, coal, and other fossil fuels are Earth material resources
Lesson 2	<ul style="list-style-type: none">• discuss how energy from the Sun enters the atmosphere• explain how some human activities affect the atmosphere• account for the occurrence of land and sea breezes, monsoons and inter tropical convergence zone (ITCZ) describe the effects of certain weather systems in the Philippines

Here is a simple map of the above lessons you will cover:



To do well in this module, you need to remember and do the following:

1. Answer the pre-test and take note of unfamiliar concepts.
2. Read thoroughly the given reading materials and make summaries.
3. Comprehend well the guide questions and follow-up questions and let them be your guide for understanding.
4. Answer every question exhaustively.
5. Browse sites and read articles, play interactive games, watch videos and etc for concept development and for assessment.
6. Take the post test to measure how much you have learned.
7. Ask, post questions for clarifications in any case you have concerns regarding the lesson.
8. Cover all the activities on their respective times of completion.
9. Have fun learning!

PRE-ASSESSMENT:



Let's find out how much you already know about this module. Encircle the letter that you think best answers the question. Please answer all items. Take note of the items that you were not able to correctly answer and look for the right answer as you go through this module.

1. Reinhard is in Eiffel Tower. Which of the following may be the closest registered value in his iPhone as the latitude and longitude of his location. Go to this site to help you arrive at the answer: <http://ctrlq.org/maps/address/>
 - A. Latitude 35.15;Longitude -80.90
 - B. Latitude 29.98;Longitude 31.13
 - C. Latitude 48.86;Longitude 2.29
 - D. Latitude 38.36;Longitude -88.20
2. Janus has fishing vessels with licenses to sail in any Philippine waters. Where might he be NOT able to legally sail?
 - A. Sulu Sea
 - B. Celebes Sea
 - C. South China Sea
 - D. Dead Sea
3. Why is the Philippines considered as one on the countries with the longest shoreline?
 - A. Because it is surrounded with large bodies of water
 - B. Because the country as an archipelago is composed of many islands each with a stretch of shoreline
 - C. Because of its many tourist-attracting beach resorts
 - D. Because of most of the Filipinos are fishermen
4. Most of the Earth's processes get their energy source from the sun. Crop growing is an example. What is the main process by which energy from the sun enters the troposphere?
 - A. Radiation
 - B. Convection
 - C. Conduction
 - D. Advection
5. What naturally occurring phenomenon is frequently formed in the Pacific Ocean and hits the Philippines and brings losses to life and damages to infrastructures?

- A. earthquake
- B. tornado
- C. typhoon
- D. tsunami

6. Which of the following resources should the use be kept at the minimum as this resource can't be replenished in our geologic time?

- A. timber
- B. geothermal
- C. ethanol
- D. natural gas

7. The resource base varies in different parts of the world because resources are not

- A. sufficient to meet the needs of developed countries.
- B. needed in the same amounts by all people.
- C. taken from both land and water in all countries.
- D. evenly distributed on the earth.

8. This mineral mined from rocks is very essential in everyday life use. It is very valuable in building construction, bridges, bodies of cars and the like.

- A. iron
- B. sand and gravel
- C. salt
- D. tin

9. What differentiates monsoon from land and sea breezes?

- A. Land and sea breezes develop during the day while the monsoon develops over a year.
- B. Land and sea breezes are local wind patterns while monsoons are global wind patterns.
- C. Land and sea breezes take place several times within the day while monsoons happen once in a year.
- D. Land and sea breezes do not affect weather patterns while the monsoon does.

10. What is the main method by which heat is distributed in the troposphere?

- A. radiation
- B. conduction
- C. convection
- D. advection

11.



Given the illustration above, where will be the direction of the wind breeze?

- A. from its left side to the right
- B. from its right side to left
- C. reverses direction every now and then from its left and right
- D. the wind will be still

12. The deforestation rate in the Philippines is 157,000 ha per year. Slash and burn is still practiced in many remote agricultural communities in our country. What do you think is the common process by which the two practices contribute to Global warming?

- A. Bare land or surfaces as the outcome of deforestation and slash-and-burn increases atmosphere's ability to absorb energy from the sun.
- B. Burning and decomposition reintroduces a great amount of carbon dioxide back to the atmosphere.
- C. Nitrogen level in the atmosphere is reduced as there is reduced vegetation to produce them.
- D. With the decrease in vegetation, earth's ability to radiate heat energy back to the outer space is reduced.

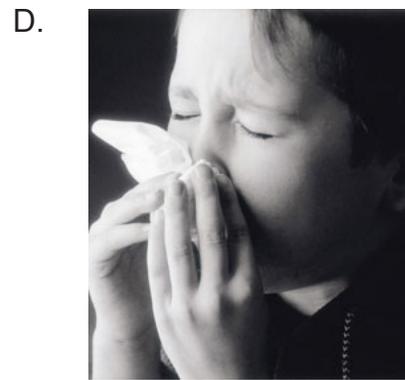
13. Which of the following may NOT be an effect of weather system in the Philippines

A.



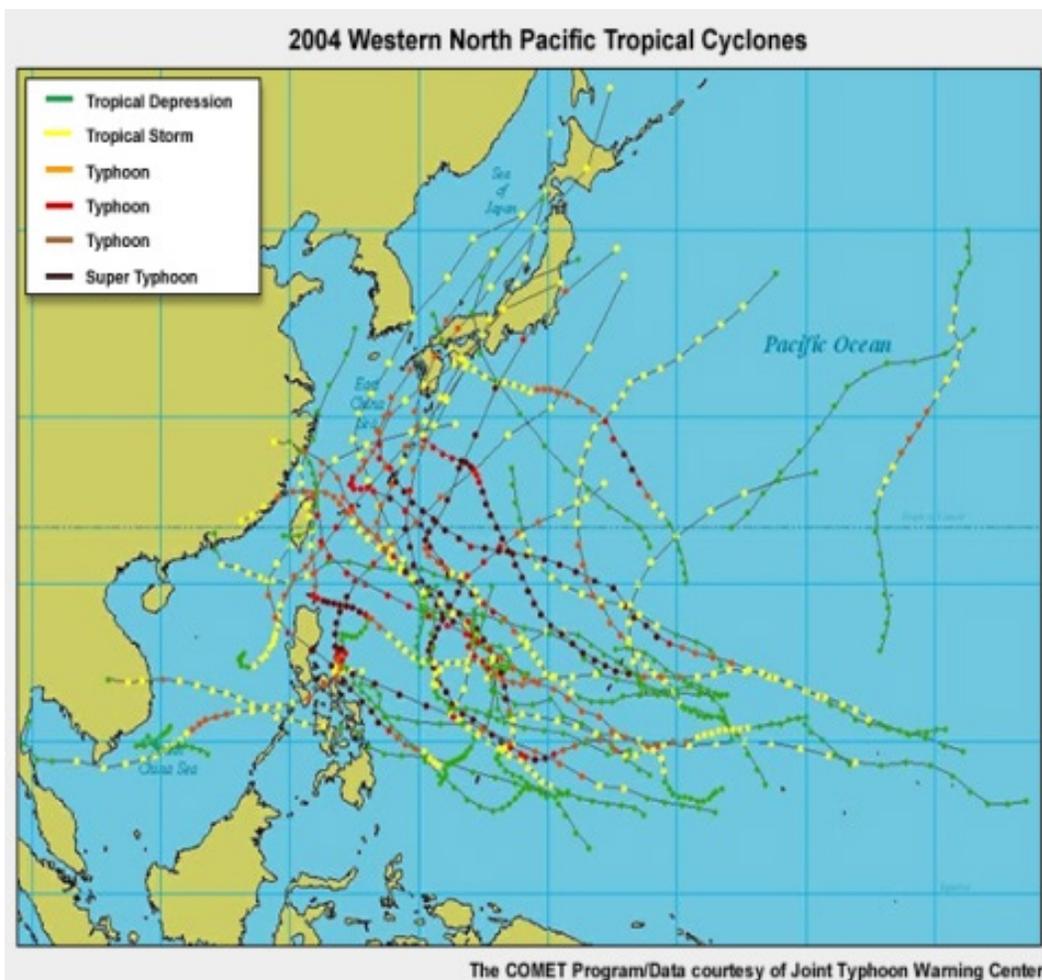
B.





14. Study each source and reflect on the given process questions. Choose the best conclusion you can derive from the sources.

A.

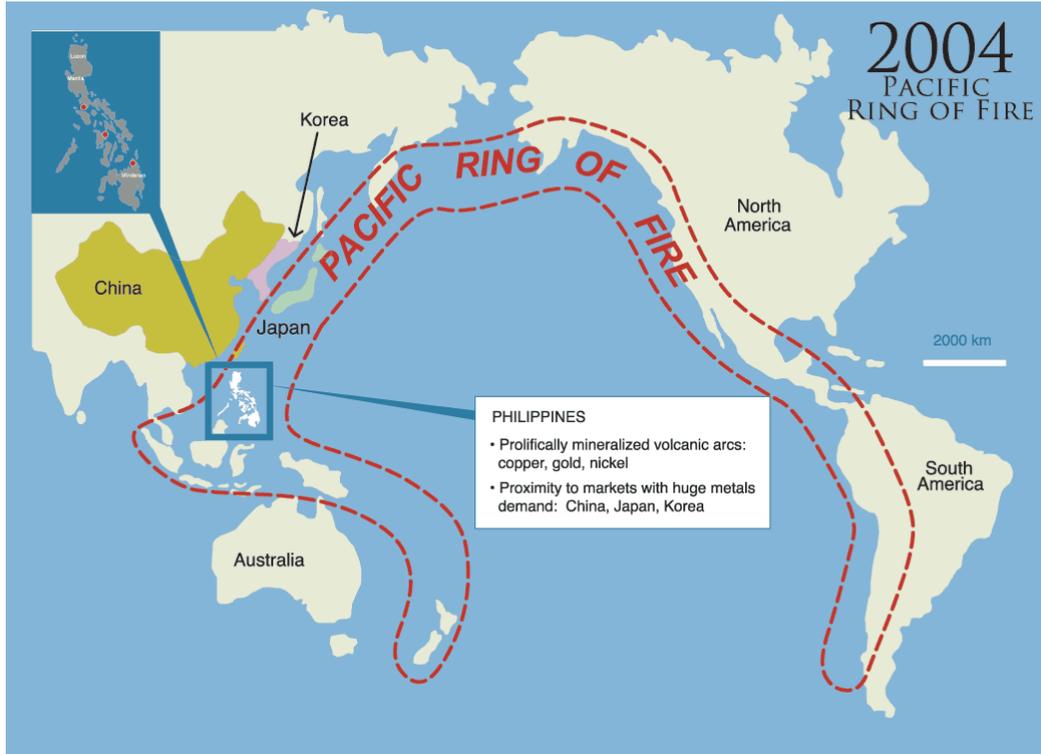


How is the Philippines situated in terms of the typhoon tracks in the West Pacific Ocean. What is the implication of this?

B. Visit the given website and read the article. <http://cpscecotours.blogspot.com/2006/08/marine-biodiversity.html>

How does the Philippines benefit from the position presented by the idea of the article?

C.



Can we consider it as an advantage for the Philippines to be a part of the Pacific Ring of Fire?

- A. The Philippines is a hazard zone.
- B. The Philippines by its location and resources has its advantages and disadvantages.
- C. Calamities are inevitable if one lives in the Philippines
- D. There is really no safe place in the Philippines as in any part of the world.

15. Which diagram shows a sea breeze?

- A.
- B.
- C.
- D.

16. Which of the following is one of the causes of monsoons?

- A. jet streams strengthen in the summer
- B. polar easterlies bring contrasting air to the tropics
- C. oceans have large, seasonal temperature changes
- D. continents heat and cool differently than oceans

17. Tacloban was really devastated with the super typhoon Yolanda. Which of the following efforts is NOT a sound action to re-establish communities?

- A. Conduct a study to better understand the nature of the threatening calamity.
- B. Assess the existing and develop a comprehensive Disaster Management Risk Reduction Program based on studies.
- C. Let people reclaim and re-establish their homes on their previous locations while encouraging them to build more sturdy homes.
- D. Create city planning to totally relocate homes in hazard zones and enhance structural protection for the existing infrastructures

18. Maria, who lives in a city, goes for a daily morning walk to treat her asthma since according to her, morning air is a lot fresher. If you are Maria, will you also opt for the same practice?

- A. Yes, because mornings are colder preventing photochemical reaction from taking place.
- B. No, because cities will always be contaminated by pollutants.
- C. Yes, because air pollutants have been circulated making mornings cleared of any contaminants.
- D. No, because there might be pollutants trapped in the atmosphere in the morning.

19. In summer, you visited a cousin living near a coastal area. While enjoying the view of the water at night, you were refreshed by the cold breeze that has run passed you. What phenomenon could explain this experience?

- A. Sinking and rising of air
- B. Rising and setting of the sun
- C. Changing seasons
- D. Warming of the planet

20. Most households in a local community use wood for cooking. You were tasked to convince the locals of the impact of burning fuel to the atmosphere's condition. You have to inform the locals about this in a manner they can comprehend. What is the correct manner of presenting the idea to the local community?

- A. Distribute leaflets detailing the different pollutants emitted in the atmosphere when burning wood.
- B. Conduct a symposium explaining the damages of burning to their health and their environment.
- C. Write a letter to the locals encouraging them to stop burning wood.
- D. Present a case study about the harmful effects of burning wood.

Lesson 1: THE PHILIPPINE ENVIRONMENT

EXPLORE



Let's start the module by finding out how the Philippines is geographically located and the natural resources it bears. As you go through this lesson, keep on thinking about this question: How does where we live influence the way we live? How does location determine the growth of a particular place?

Activity 1: It's More Fun in the Philippines



The Department of Tourism launched a jingle with the title "It's More Fun in the Philippines". This features the beautiful places and the celebrations around the Philippines that are worth visiting. We'll find out how much you know about the Philippines at this point in time. Match the first column with the second column by drawing a line.





As a Filipino, do you really believe that it's more fun here in the Philippines? Why? What places are often promoted to foreigners and investors interested in our place? What's present in those places that enticed them? How much do you know the places and the resources of our country? Let's find out more of your knowledge by answering the IRF Chart.

Activity 2: Initial-Revised-Final



Using the IRF Guide, write your initial idea on the INITIAL row with regards to the question. You will be asked later to go back to this sheet and check for any difference in your answer as you go through the module.

How does where we live influence the way we live?
Initial
Revised
Final

End of EXPLORE:



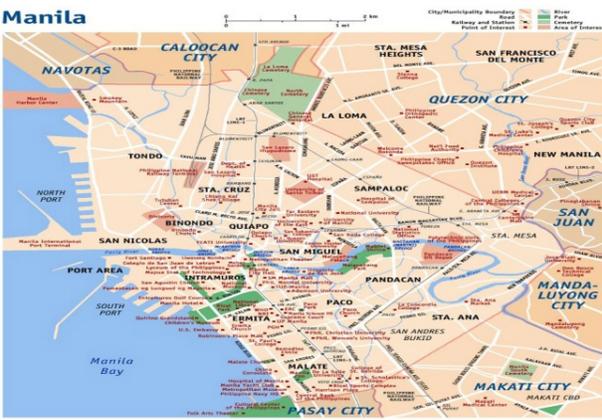
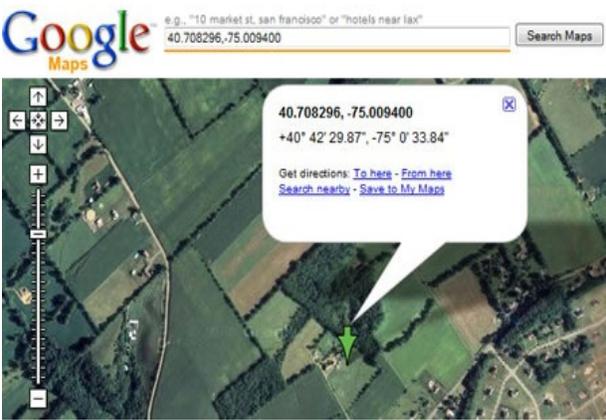
You gave your initial ideas on the geographical setting of the Philippines, its topographical features and the atmospheric interactions affecting our country. You have also presented your ideas on the natural resources of our country on different places. Let's find out how others would answer the question and compare their ideas to our own. As you compare, you will also learn other concepts which will help you complete the required project. This project is about creating information dissemination in any media promoting the viability of a location for settlement and investment. We will start by doing the next activity.

FIRM-UP

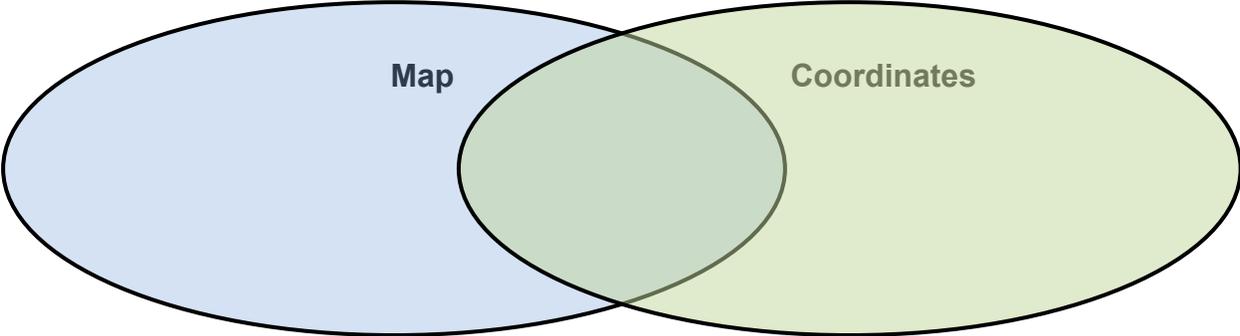
Your goal in this section is to learn and understand key concepts on locating places using a coordinate system and the geographical setting of the Philippines. You are also going to know the many natural resources that our country have and their impact to the Filipino people.

Activity 3: Picture Analysis

Using the graphic organizer Venn diagram, compare and contrast the two methods of identifying the location of an object. Identify similarities and differences with which you are going to compare the illustrations. Visit the following links to gain additional insights.

<p style="text-align: center;">MAP</p>  <p>http://www.wikihow.com/Read-a-Map (this presents the process in using a map)</p>	<p style="text-align: center;">COORDINATES</p>  <p>http://www.maptools.com/tutorials/lat_lon (this introduces coordinate system and its related concepts)</p>
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MODES OF LOCATING PLACES





How do you think each method works? How are they similar and different and in what aspects? What scientific processes are involved in each method? In what situations today does each method find its use?

Activity 4: The Coordinate System



Using the graphic organizer 'Sequence Chart', identify the sequence on how to locate a certain location with the use of coordinates. Visit the link below for information.

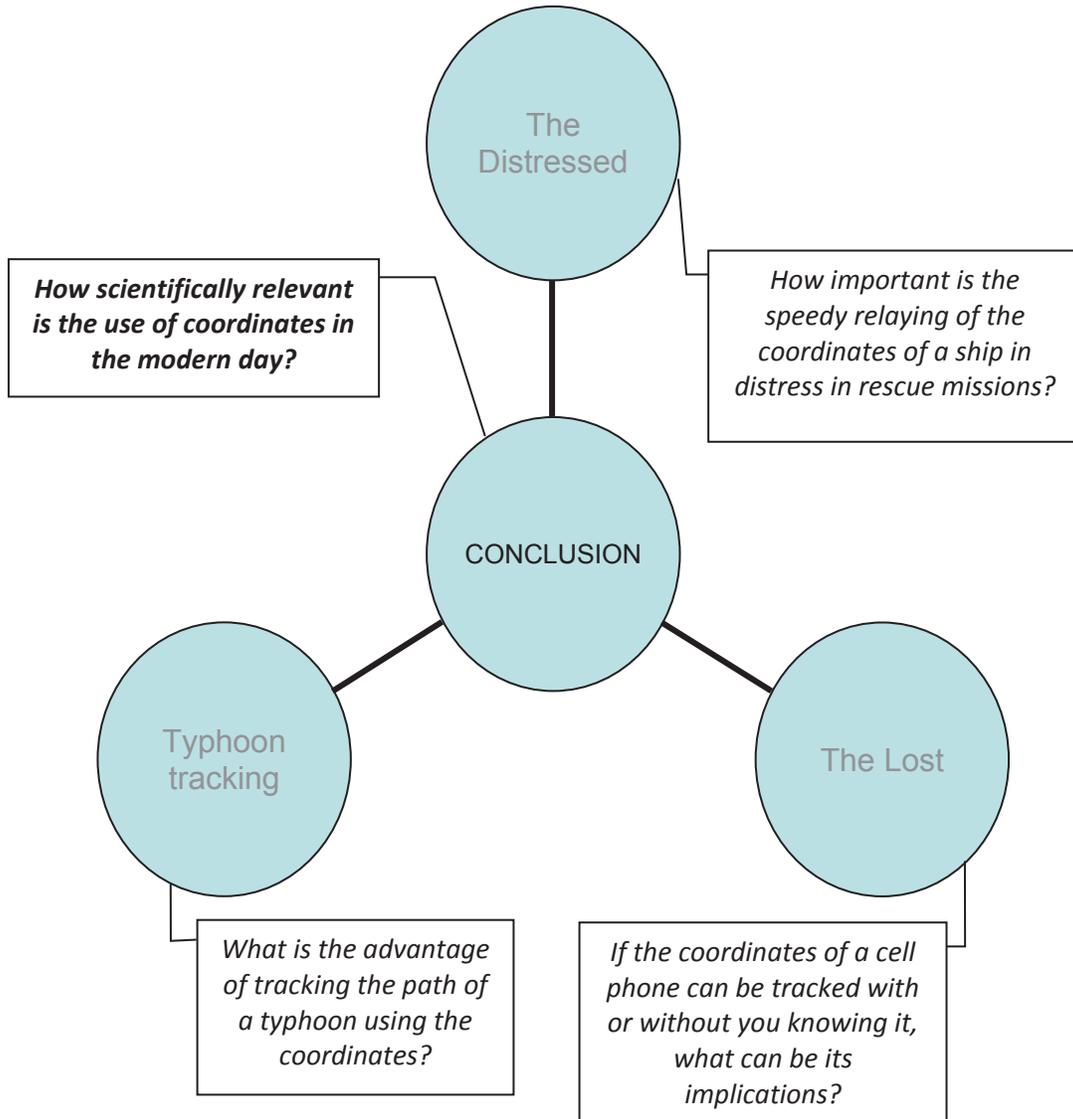
<http://geography.about.com/cs/latitudelongitude/a/latlong.htm> (this offers a reading on relevant concepts related to locating places using coordinates.)

Locating Places Using Coordinates



What concepts are necessary to be able to identify coordinates of a location? What are the processes involved in determining a place using a set of coordinates? How useful is this concepts and its applications?

Activity 5: The Need for Coordinates



http://www.tutor2u.net/blog/images/uploads/temp_file_Capture11.PNG
(it shows a table of typhoon tracks from the time a typhoon develops till it dissipated)

http://www.nytimes.com/2011/03/26/business/media/26privacy.html?_r=0
(this is a reading article on how a man's location is tracked)

<http://www.uscg.mil/hq/cg5/cg534/MassRescueOps/MRO-GoodSamaritanAlaskaGuide.pdf>
(this presents a guide in responding a ship in distress)

Activity 6: Coordinate Map Match Games

DESCRIPTION:

Now that you have worked with coordinate system in finding locations, go to the following links of interactive games to assess your learning:



<http://www.kidsgeo.com/geography-games/latitude-longitude-map-game.php>
(an online-interactive game of locating a place in an area using coordinates)

<http://www.purposegames.com/game/longitude-and-latitude-quiz>
(an online interactive game of determining the place on earth given with coordinates)



How well do you apply your learning on coordinates in finding locations; developing, proficient, excellent? How will your self-rating determine the learning-interventions that will you initiate?

Activity 7: Google Mapping the Philippines



Now that you know how to interpret the coordinates of a location, visit the link : <http://ctrlq.org/maps/address/>
Navigate through the application and study the geographical setting of the Philippines. Use a map of a Philippines as an illustration and express your observation in a two-minute dialogue using blabberize.com.



Hi, I'm the Philippines....



How would you describe the land that comprise the country? What borders our country based on your observation? What are its neighboring landmasses and how distant are they? What countries could they be? What can be the general advantages and disadvantages of the Philippine geographical setting?

Activity 8: The Philippine Archipelago Fun Trivia



With your stock knowledge about the geographical setting of the country and the previous activity, have fun taking this online interactive quiz, “Philippine Archipelago Fun Trivia”. Go to this website and enjoy:
<http://www.funtrivia.com/html5/index.cfm?qid=143552>
 (this is an interactive quiz on Philippine archipelago)



How much have you learned about your country geographically? How does it feel to have known that much about your country? What feedback may the result of the trivia provide to yourself?

Activity 9: The Philippine Resources



You already have familiarized yourself with the geographical setting of our country. The next activity will let you know the many natural resources of our country. Organize and summarize the information you will find in the number of sources you’ll read. Using the template, write down the answers to the questions by going through the text on the various links provided. When done answering all the questions, write a summary for the information gathered. Go to the websites below to complete the template.

SOURCES	QUESTIONS	ANSWERS
http://www.nscb.gov.ph/peenra/results/mineral/	Why are these listed minerals considered as a resource in comparison with other similarly abundant minerals. What are their possible uses? What are its possible impacts to the places that possesses them?	
http://en.worldstat.info/Africa/Philippines/Land	Do the lands in our country have similar use? What is most abundant use of the land in the Philippines? How are these affecting the lives of the Filipinos on this certain area?	

http://www.doe.gov.ph/fossil-fuels/coal	<p>In what parts of the country are coal and other fossil fuels found? What is the significance of these resources? How can the living conditions of the people dwelling on these locations be possibly affected?</p>	
<p>SUMMARY: How does where we live influence the way we live? How does location determine the growth of a particular place?</p>		

Activity 10: Natural Resources Mind-map



You have just learned some of the resources of the Philippine Archipelago. Are you confident now in determining the natural resources in your own community? The next activity will at least scientifically equip you in identifying natural resources and its potential. Using a mind-map, summarize the idea presented by the given link.
http://www.epa.gov/osw/education/quest/pdfs/unit1/chap1/u1_natresources.pdf



 Can you already determine potential resources in your community? Can you determine the extent of how long can these resources be utilized? What can be the possible outcome of the harvesting of these resources? Being scientifically aware of it, what can you possibly do about them?

End of FIRM UP:

In this section, the discussion was about locating places with the use of coordinate systems, determining the geographical setting by which the Philippines is bounded and recognizing the earth resources that our country bears.



Go back to the previous section and compare your initial ideas with the discussion. How much of your initial ideas are found in the discussion? Which ideas are different and need revision?

Now that you know the important ideas about this topic, let's go deeper by moving on to the next section.

DEEPEN



Your goal in this section is to apply the learned concepts on coordinate system, the place's resources and its impact to the living condition of the people of the community. Let us then check our progress and be guided with the questions we reserve for this module.

1. ***How does where we live influence the way we live?***
2. ***How does location determine the growth of a particular place?***

Activity 11: Initial-Revised-Final

How does where we live influence the way we live?
Initial
Revised
Final

Activity 12: You Are Where You Are (Scaffold 1)



Now that you have the idea of what are resources, how people may utilize them and what can be their possible impact to an area, you are going to study communities and their resources. Visit the links and watch the videos.

- <http://www.youtube.com/watch?v=sRnsTxIjQRk>
- <http://www.youtube.com/watch?v=SIOIO-fjXc4>
- <http://www.youtube.com/watch?v=tEE8nR7tjRU>

Complete the graphic organizer Contrast-and-Compare afterwards.

QUESTIONS	Fishing Village	Farming Village	Mining Community
How will you describe the geographical feature of the area?			
What major resource is found in the area?			
Why is this resource a demand?			
What mostly are the means of living of the people in the area?			
How would you describe the economic condition of the community?			
How does where we live determine the way we live?			



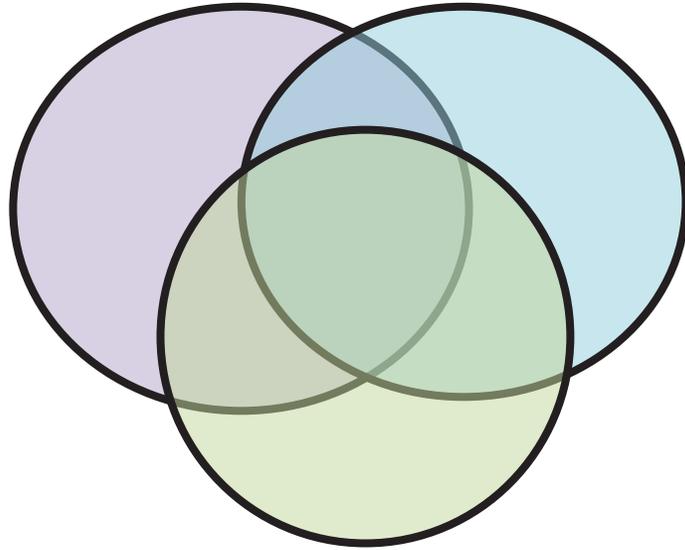
How did the activity help you understand the relation between resources and of a place and the livelihood? Can you already determine what may be the fate of your community in the future? Can you be sure that what may the people enjoy now in their places may still be enjoyed by the next generation? What may be the course of action to this issue?

Activity 13: Cause and Effect



The previous activity led you to understand how people are affected with where they live and the resources they have. The next activity will let you understand the fate of communities with how people utilize resources. You will identify the different effects of resource utilization in various places in our country. Study the contents of the following given links. Complete the graphic organizer. Describe the nature of each situation in the individual circles. Identify what is common among overlapping circles and place your conclusion at the convergence of the three circles.

<http://lutopanmining.blogspot.com/> - copper mining effect of the area in Cebu
<http://www.iohsad.org/11/06/mining/mining-philippines-and-effects-occupational-health-and-safety-mine-workers> - presents occupational hazards of mining*
<http://www1.american.edu/ted/PHILWOOD.HTM> - presents impact of deforestation



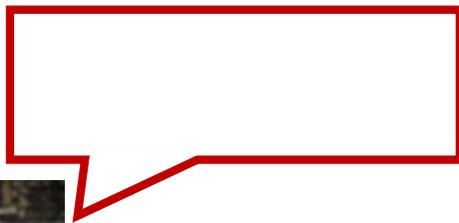
What are the fates of the different communities? How would the type of resource determine the future of the community? What are the considerations that local government units would look into in assuring longevity of the existence of the community?

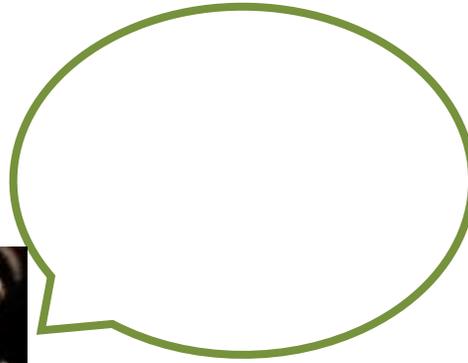
Activity 14: The Relocation Misconception



You were presented with activities in the past that aids you in determining the relation of the area, its resources and the people as well as the possible fate of an area with how people utilize its resources. Present the possible points-of-view of the following people with the given statement. Express your perceived thoughts using voki.com.

“The government can easily relocate any displaced families as long as there is a safe and vacant location somewhere”





How did the activity help you determine what makes an area desirable for settlement? What are the considerations to be made for identifying relocation sites to help the displaced citizens? How did the activity help you understand the relation between people and its environment.

End of DEEPEN:



In this section, the discussion was about the geographical setting and the resources of our country and how they impact communities.

What new realizations do you have about the topic? What new connections have you made for yourself?

Now that you have a deeper understanding of the topic, you are ready to do the tasks in the next section.

TRANSFER

Activity 15: Initial-Revised-Final



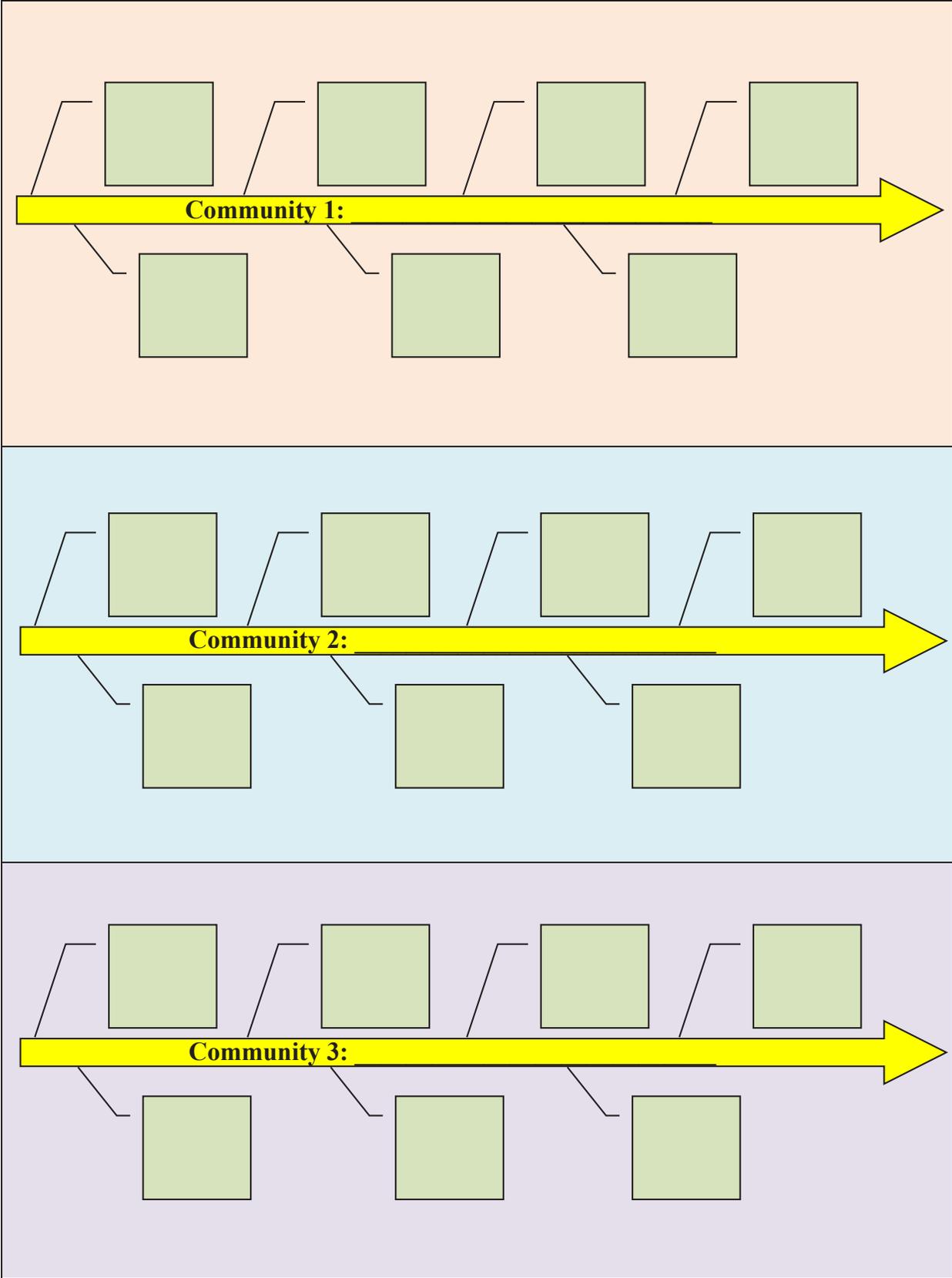
After going through series of activities, visit the IRF Guide once again, write your final idea on the FINAL row with regards to the question. What can you say about the development of your answer? Can you see yourself developing strategic reasoning?

How does where we live influence the way we live?
Initial
Revised
Final

Activity 16: Comparative Study (Scaffold 2)



Now that you are well equipped with assessing the relationship between the resources, their location and the people in the community, you are going to conduct a case study on the scientific accounts of the development of your chosen communities. You are going to complete a CONTINUUM graphic organizer. You have to do community archive researches. Write on the boxes important scientific milestones in the history of the community. (e.g. discovery of the resource, rise and fall of the demand of the resource due to its use, economic and environmental impacts, population increase and decline until present situation)



Generalization: From the researched three cases, generalize the effect of one's geographic location.



When was the resource of the place discovered? What is the use of this resource? How long is this resource projected to last? How is this resource affecting the lives of the people in the community? What is its effect on the population growth of the community? What is the present impact of the resource utilization and recovery?

Activity 17: Checklist



You have observed yourself grow in learning with all the activities that you were asked to do. You are going to track your own progress and assess whether you are ready to embark on the final tasks. Check on the chart below the competencies that you confidently understand already. Go back to those past activities and work on those again until you will gain proficient understanding.

Competencies	Status	Depth
<ul style="list-style-type: none"> demonstrates how places on Earth may be located using a coordinate system 		
<ul style="list-style-type: none"> relate the location of the Philippines with respect to the continents and oceans of the world 		
<ul style="list-style-type: none"> recognizes that soil, water, rocks, coal, and other fossil fuels are Earth material resources 		
<ul style="list-style-type: none"> describe ways of using Earth's resources sustainably 		



In what competencies are you still having difficulty? What do you plan to do with those inefficiencies that you have realized?

End of TRANSFER:



In this section, your task was to conduct a mini investigation on the growth of certain locations, the factors that dictates it and its impact to the community. You will be embarking on another lesson before you will finally conduct your final output. Enjoy learning further.

Lesson 2: Interactions in the Atmosphere

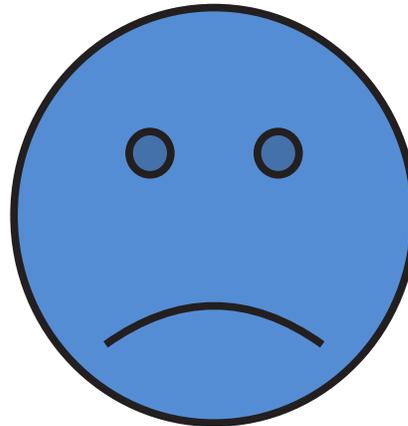
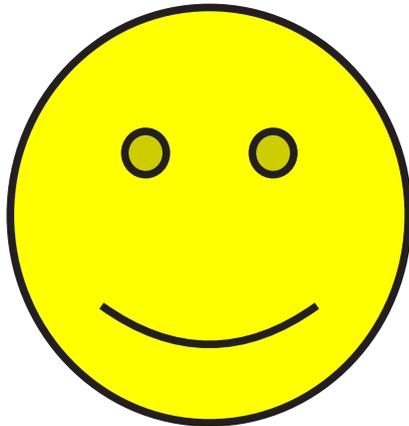
EXPLORE:



In the first lesson, you have learned how the geographical location and the resources determine the place's suitability for habitation, but a place can never be without its atmosphere, thus we use the same questions: How does where we live influence the way we live? How does location determine the growth of a particular place? Let these questions guide you through this lesson just as you were guided by them on the first lesson.

Activity 1: Where Do I Belong?

Let's begin our journey of getting to know the atmosphere. Figure out whether the atmospheric phenomenon is desirable or not. We'll find out how much you know about the atmospheric activities at this point in time. Match the object in the corresponding faces.





Based on the results, how much do you know about the occurrences in the atmosphere? Is your understanding enough to be able to proactively deal with atmospheric phenomenon?

Activity 2: Anticipation-Reaction Guide



Let's find out some more by answering the Anticipation-Reaction Guide. Using the AR Guide, write agree or disagree for each statement given on the 'BEFORE' column. You will be asked later to go back to this guide and check for any difference in your answer as you go through the module.

BEFORE Agree or Disagree		AFTER Agree or Disagree
	1. The layers of the atmosphere are arranged in the following order: mesosphere, troposphere, stratosphere, and thermosphere.	
	2. The temperature in each layer of the atmosphere increases as the layer progresses.	
	3. Clouds form in the troposphere.	
	4. Ozone layer is found in the mesosphere.	
	5. Convection accounts for the distribution of heat in the atmosphere.	
	6. Sea breeze forms when the warm air over the water is pushed by the cold air over the land.	
	7. Land and water heat and cool at the same time.	



How would you assess yourself in terms of understanding atmospheric phenomenon? How are these knowledge be applicable to day to day living?

End of EXPLORE:



You gave your initial ideas on the topic atmosphere. In the next section, we are going to know more about it as we go through a series of activities and some readings to gather information that might help you validate your answers on the ARG activity.

FIRM UP:



After giving your initial ideas on the topic atmosphere, let's find out how others would answer the question and compare their ideas to our own. As you compare, you will also learn other concepts which will help you complete the required project. This project is about creating information dissemination medium promoting the viability of a location for settlement and investment. We will start by doing the next activity.

Activity 3: Video Presentation



Watch the video, <http://studyjams.scholastic.com/studyjams/jams/science/weather-and-climate/earths-atmosphere.htm>

Using the graphic organizer Comparison Notes, identify the characteristics of each layer of the atmosphere and cite evidences of their importance. In the horizontal heading, choose categories with which you are going to compare the different layers of the atmosphere.

Comparison Notes

Category/				
Layer of the Atmosphere				



What characteristics differentiates one layer of the atmosphere from the others? Are these characteristics giving any hint as to what possible atmospheric phenomenon may be occurring on them? Do you know how people may adapt with those phenomena?

Activity 4: Getting to Know the Atmosphere

Now that you already know how to distinguish one layer of atmosphere from the other, let's delve in more deeply into each layer and find out how your knowledge about the characteristics of each layer might contribute to the understanding of atmospheric phenomenon happening on them.

Organize and summarize the information you will find in the number of sources you'll read. Using the template, write down the answers to the questions by going through the text on the various links provided. When done answering all the questions, write a summary for the information gathered.



Follow the links below to complete the template.

http://education.nationalgeographic.com/education/encyclopedia/atmosphere/?ar_a=1&ar_r=3#page=2. This contains discussion on the composition of the atmosphere as well as the various phenomena taking place in its different layers.

<http://www.enchantedlearning.com/subjects/astronomy/planets/earth/Atmosphere.shtml> This site describes the different layers of the atmosphere in terms of altitude, temperature and the likes.

QUESTIONS	SOURCES	ANSWERS
How are the different layers of the atmosphere classified?		
What characteristic/s identifies/identify one layer from another layer of the atmosphere?		
How do the characteristics of each layer influence the various activities possibly taking place in the atmosphere?		
What layer in the atmosphere will you be likely affected? Why? How?		
SUMMARY		



Are there similar atmospheric phenomenon happening to all the layers of the atmosphere? How would the presence of weather disturbances on particular layers affect the a place? What may be the cause for the variations of atmospheric phenomena in various layers

Activity 5: Heat is On



Now that you know that there are different atmospheric activities that happen in the different layers in the atmosphere, let us probe deeper in one of the factors that may have caused it. The next activity will lead you to investigate how heat transfer plays role in atmospheric activities.

Complete the Fact/Opinion sheet and verify your opinion later by performing the suggested experiments.

FACT	OPINION
Heat Transfer in the Atmosphere	
Atmospheric Circulation	

4.1. Laboratory Activity

A. Heat Transfer

B. Atmospheric Circulation

4.1.A. Heat Transfer

For the activity on heat transfer, follow this link <http://www.education.com/science-fair/article/greenhouse-effect-heat-transfer-atmosphere/>. This link provides an experiment that will help you determine what affects the atmosphere's ability to trap energy.

Answer the guide questions that follow. Write your observations and responses in your journal notebook.



How do the temperature readings compare in the two set ups? How did the presence of the plastic wrap affect the temperature reading in the box? How does the activity explain thermal distribution in the atmosphere? Does the result of the activity confirm your opinion? Explain.

4.1.B Atmospheric Circulation

For the test on atmospheric circulation, click on the link <http://www.education.com/science-fair/article/heat/>. The site will let you examine the cause of the difference in the surface temperature on land and water.

In your journal, write the observation/s you will gather in the conduct of the activity. Do not forget to answer the guide questions below.



Which substance was heated first? How will the activity explain local air movement? How will the difference in heating capacity explain global atmospheric circulation? Does the result of the activity confirm your opinion?

Activity 6: Wind: Where Does it Come and Go?

After studying the model and demonstrations of the atmospheric circulation, summarize your understanding of the effects of temperature difference to air movement and on a global scale describe how inter-tropical convergence zone occur. You may use a chain of events graphic organizer for your summary.



To help you complete your chain of events worksheet, watch the video links http://ph.video.search.yahoo.com/video/play;_ylt=A0S00xhTh6tQ0zsAACPeRwx.;_ylu=X3oDMTBrc3VyamVwBHNIYwNzcgRzbGsDdmlkBHZ0aWQD?p=global+circulation&vid=FB9D71C51D3AC62A3AADFB9D71C51D3AC62A3AAD&l=1%3A55&turl=http%3A%2F%2Fts3.mm.bing.net%2Fth%3Fid%3DV.4871013416632390%26pid%3D15.1&rurl=http%3A%2F%2Fwww.youtube.com%2Fwatch%3Fv%3DDHrapzHPCSA&tit=global+circulation+%281-54%29&c=1&sig=11a08t11c&fr=yfp-t-711

-This site contains discussions about the effect of solar energy to global circulation.



Do you now realize the connection between heating of the sun, the rate by which temperature rises on different parts of the globe and the resulting convection currents? How are they connected with the weather phenomenon of various places? **How would that affect the lifestyle of the people living in a certain location? How would the atmospheric phenomena determine the desirability of a place?**

Activity 7: Hot! Hot! Hot!



You are able to realize in the previous activity that different parts of the globe heat up differently. To better answer the questions asked in the previous activities, Read the following research/feature article and answer the following questions.

The Potential Impacts of Climate Variability and Change on Temperature-Related Morbidity and Mortality in the United States

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1240665/pdf/ehp109s-000185.pdf>

What role did the temperature play in the study?	
Why is the studied phenomenon affecting differently the determined states yet not much the tropics?	
How is the phenomenon affecting the desirability of those locations?	

The Impact of Climate Change on Natural Disasters

http://earthobservatory.nasa.gov/Features/RisingCost/rising_cost5.php

What general trend of temperature is cited in the article?	
What are its projected effects?	
How may the phenomenon affect certain places?	

How does where we live Influence the way we live?

Activity 8: Heat and the CO



Now that you know how solar heating propels atmospheric phenomenon which has many advantages and disadvantages, you are going to do some probing on a global heating that is perceived to be detrimental. Your next task is to look at the connection between carbon dioxide and the global heating phenomenon known as the greenhouse effect by watching the video link <http://www.youtube.com/watch?v=kwtt51gvaJQ>. Share your new

understanding to other people in a more exciting way! Make a flyer that will inform them of the significant connection between carbon dioxide and greenhouse effect. You may still follow the format that you used earlier. Include in your flyer the comprehensive answers to the following guide questions.

What effect did carbon dioxide have on temperature? How does this effect relate to what happens in the atmosphere? What impact will this effect have on the atmosphere's condition?

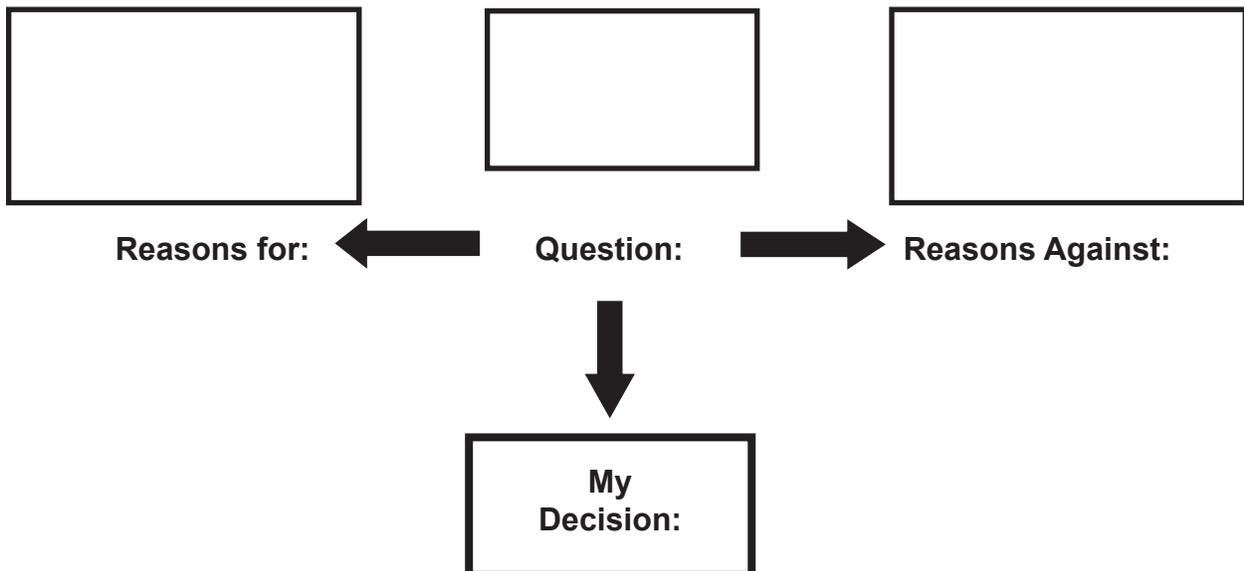
Activity 9: A Walk to the City



You just have convinced yourself on the impact of carbon dioxide on temperature in the previous activity. But being convinced may not make sense not unless you are able to do something worthwhile with what you have learned. You are now ready to make use of your learning into good use on the next activity.

Make a list of the number of cars, jeeps, tricycle and even trucks you've seen on your way to school. On a Decision Making Chart, answer the question, "Does the volume of traffic affect the air quality in my local community?". Write your reasons for saying YES on the reasons for column, and the reasons for saying NO on the Reasons Against column. At the bottom of the chart, make a position by writing your decision on the same question. Now that you've learned that atmosphere has the capacity to trap energy from the sun, examine this time the effects of this energy to different atmospheric conditions by performing the laboratory activity about atmospheric circulation.

Decision Making Chart



End of FIRM UP:

In this section, the discussion was about the characteristics of the layers of the atmosphere and the effects of temperature difference in atmospheric circulation.

Go back to the previous section and compare your initial ideas with the discussion. How much of your initial ideas are found in the discussion? Which ideas are different and need revision?



Now that you know the important ideas about the characteristics of the atmosphere, let's go deeper by examining how these phenomena affect humans in return.

In this section, the discussion was about locating places with the use of coordinate systems, determining the geographical setting by which the Philippines is bounded and recognizing the earth resources that our country bears.

DEEPEN:



How has the atmosphere affected people? How do man's activities relate with the Earth's atmosphere? What activities do humans carry out with reference to the condition of the atmosphere? **How does where we live influence the way we can live more? How does location determine the growth of a particular place?** Find out the answers to these questions from the activities below.

Activity 10: The Land



After learning the concepts on what affects atmospheric phenomena, the people's contribution on it and its possible impact t on communities, you are now ready for the next activity. Go to the given links and analyze the each situation. Answer the processing questions and later on, form a generalization.

<p>http://www.youtube.com/results?search_query=yolanda+storm+surge -this a video that shows a rare tidal surge in Tacloban brought about by the super typhoon Yolanda in 2013</p>	<p>http://www.sunstar.com.ph/cagayan-de-oro/local-news/2014/01/24/moreno-sendong-tragedies-thing-past-324801 -this is shows a news of flash flood in Cagayan.</p>	<p>http://www.sunstar.com.ph/davao/business/2014/01/24/organic-farming-benefits-lumads-324954 -this article presents the progressive banana plantations in Mindanao</p>
<p>Why did the typhoon surge happen?</p> <p>How did it affect Tacloban?</p> <p>Why is it happening in the recent years?</p> <p>Will this tidal surge still happen in the future? Explain.</p> <p>How do people view the place in terms of likelihood of habitation and commerce?</p>	<p>What caused the flash flood?</p> <p>Were there any predictions in the past that floods will happen?</p> <p>How did it affect the communities of this place?</p> <p>How is Cagayan viewed in terms of conduciveness for habitation and commerce?</p>	<p>What is the produce of the place?</p> <p>What can be the weather demands of these crops?</p> <p>How will this benefit the community?</p> <p>How long will this situation last?</p>
<p>Conclusion: How does where we live influence the way we live?</p>		

Activity 11: Debate

Using the data you've gathered from the series of activities conducted on the possible effect of atmospheric phenomena to certain locations, stress a position by debating on whether **LOCATION DETERMINES THE GROWTH OF A PARTICULAR PLACE**. Make sure to support your opinion with the needed information.

End of DEEPEN:

In this section, the discussion was about the implications of weather phenomenon on various places.



What new realizations do you have about the topic? What new connections have you made for yourself?

Now that you have a deeper understanding of the topic, you are ready to do the tasks in the next section.

TRANSFER



Having seen the possible implications of the damage we create to atmosphere and the impact of its changes on us, let us look closer at how much of the changes taking place in the atmosphere can determine the viability of a place for settlement. As you progress to the activities, remind yourself to look back at the questions:

How does where we live influence the way we can live more?

How does location determine the growth of a particular place?

Activity 12: News–on-the Go! (Scaffold #3)



As a member of EDGE, a non-profit organization, you were tasked to help in the campaign of promoting your own school. Create a flyer indicating the perks of enrolling in your school. Refer to the previous activities in making the flyer. You may develop your flyer based on the list of questions below:

- a. Why must your school be preferred in terms of its location?
- b. What resources can your school offer?
- c. How is your school ready to brace varying weather and atmospheric phenomena?

Activity 13: Dialog Box Completion



Having established your position on the implication/s of man to his environment, complete a dialog box template filling in the box your position/argument on the situation given. Use voki.com

After the catastrophic typhoon that hits Central Visayas, many citizens begin to be concerned with their way of living with where they are situated. In response to these issues about the environment, how would you feel if you are a/an;

***Disaster and Risk Management Personnel
Survivor
Entrepreneur
Barangay Official***

Activity 14: Reflection Log



Write your reflection/s about the DIALOG-BOX activity in your blog. Use blogger.com. Express your thoughts on the questions below:



Which role did you feel most connected to? Will scientific knowledge help ensure safe and productive interaction between people and its environment? Did the activity help you better understand the interaction between the people and the community?

Activity 15: Performance Task



Your province is to celebrate next month its 50th charter day. The big event is projected to draw a lot of people like law makers, businessmen, tourists and all types of citizens. As the adviser to the mayor of one of the towns in the province, you are requested to draft a promotional poster/video/PowerPoint Presentation assessing the viability of your town in terms of its resources and weather conditions, basis for living and investment suitability. This is to be presented to the governor for 5 minutes during the provincial meeting. The quality of your material and presentation will be assessed by the governor in terms of comprehensiveness, clarity and organization, persuasiveness and effective use of visual aids.

On the next page is the rubric that will be used to assess your work. Please be guided accordingly.

RUBRIC: Promotional Presentation

CRITERIA	EXEMPLARY (4)	SATISFACTORY (3)	DEVELOPING (2)	NEEDS IMPROVEMENT (1)
CONTENT	Presents comprehensive scientific reasoning with detailed elaboration of the pros and cons.	Presents a good number of scientific reasons reasoning with sufficient elaboration of pros and cons.	Presents insufficient and inconsistent scientific evidences in some parts with little elaboration of pros and cons	Weak scientific reasoning was presented
CLARITY/ ORGANI- ZATION	A well thought out order of ideas is very apparent. More than enough details are used to build up concepts. Order of ideas is apparent and has an interesting progression.	Order of ideas is apparent. Sufficient details are geared to the central idea.	Order of ideas is confusing in some parts less apparent. Some details are not specific to one central idea.	Order of ideas is not clear. No supporting details were given.
PERSUA- SIVENESS	Voice projection and confidence are evident in posture and eye contact with audience	Confidence is adequate. Voice projection is loud and understandable enough.	Lacks confidence. Some error and voice projection is to some extent inaudible.	Delivery is almost incomprehen- sible.
USE OF VISUAL AIDS	All important data are collected and are presented and organized in very readable and	There are a number of data collected, presented and organized in	The use of visual aids did not help much the presentation. These were distracting in	No data is shown to help support the presentation.



At this point, let's go back to your initial ideas and check whether you still stick to them or if you would like to change some of them after having undergone all the activities. Right your answers on the AFTER column.

Activity 16: ANTICIPATION-REACTION GUIDE

BEFORE Agree or Disagree		AFTER Agree or Disagree
	1. The layers of the atmosphere are arranged in the following order: mesosphere, troposphere, stratosphere, and thermosphere.	
	2. The temperature in each layer of the atmosphere increases as the layer progresses.	
	3. Clouds form in the troposphere.	
	4. Ozone layer is found in the mesosphere.	
	5. Convection accounts for the distribution of heat in the atmosphere.	
	6. Atmospheric temperature drops in mid-day due to an outgoing infrared radiation.	
	7. Sea breeze forms when the warm air over the water is pushed by the cold air over the land.	
	8. Breeze balances the distribution of heat in the atmosphere.	
	9. Land and water heat and cool at the same time.	
	10. Burning releases methane in the atmosphere.	

End of TRANSFER:



Now that you've completed the performance task, take time to recall the entire experience and write a brief reflection by responding to the series of prompts provided in the table.

PROMPT	RESPONSE
What skills did you acquire in the completion of the performance task?	
What did you find the most challenging part of the task?	
What did you learn about your own learning throughout completing this task? Specifically, how will you apply that knowledge in the future?	



Try to answer the Post-Assessment now and see for yourself how much your understanding about the Earth's atmosphere has improved.

POST-ASSESSMENT:



It's now time to evaluate your learning. Choose the letter of the answer that you think best answers the question. If you do well, you may move on to the next module. If your score is not at the expected level, you have to go back and take the module again.

1. Which body of water lies on the eastern side of the country where most typhoons form:

- A. Sulu Sea
- B. Celebes Sea
- C. Pacific Ocean
- D. South China Sea

2. Which of the following does not refer to the Philippines geographically?

- A. belongs to the Pacific Ring of Fire
- B. gateway to West Asia
- C. typhoon prone country
- D. Asia's rising tiger

3. Edwin is having a world tour. He posted on his Twitter account the message "I finally visited this place: (Latitude 51.18; Longitude -1.83)". What could be the place and the famous landmark he visited? Go to this site to help you arrive at the answer: <http://ctrlq.org/maps/address/>

- A. Lady Liberty
- B. Eiffel Tower
- C. Great Pyramid of Giza Egypt
- D. Stonehenge

4. Jean plans to have a cruise. In terms of proximity to the country, what cruise can be the most practical to have?

- A. American Cruise
- B. Australian Cruise
- C. Asian Cruise
- D. European Cruise

5. What may be brought about by the archipelago nature of Philippine country?
- A. difficulty in reaching other places due to fragmentation of land
 - B. surrounding waters offers rich fishing ground
 - C. long shoreline offers diverse marine ecosystem
 - D. all of the above
6. Many metal products and by-products we use everyday are derived from metal containing rocks called
- A. magma.
 - B. lava.
 - C. oil.
 - D. ore.
7. Why is it that the only means by which the energy of the sun can reach the earth is through radiation?
- A. The source of the energy, the sun, is emitting radiant energy.
 - B. Only radiation does not need any medium for heat energy to transfer.
 - C. Earth is too far from the sun for convection and conduction to be possible.
 - D. The fastest mode of heat transfer is through radiation.
8. What is the main reason for the heating of the troposphere?
- A. radiation
 - B. convection
 - C. conduction
 - D. advection
9. How is heat gained in the troposphere transferred?
- A. radiation
 - B. convection
 - C. conduction
 - D. advection
10. What accounts for the rising and sinking of air?
- A. uneven heating on the earth's surface
 - B. rotation of the Earth on its axis
 - C. difference in the pressure at atmosphere's layers
 - D. presence of land and water forms on earth

11. Why do monsoons happen?

- A. Because jet streams strengthen in the summer
- B. Because polar easterlies bring contrasting air to the tropics
- C. Because oceans have large, seasonal temperature changes
- D. Because continents heat and cool differently than oceans

12. Many of the great civilizations in the history have sprung along rivers and deltas. This is true with many places in the Philippines like Cagayan de Oro and Butuan. Here are some observations and statements about these places.

- Agriculture and aquaculture are mostly the livelihood of people living along rivers and deltas.
- “Seasonal floods bring fortune to the community alongside rivers”

Which can be the best inference we can derive from these observations?

- A. A river system with water all year round acts as cooling agents for crops alongside the rivers and water organisms to grow well.
- B. Where there is water, plants and animals will surely be thriving healthily.
- C. River systems and deltas are but waterways for easier transport of agricultural goods. Fish are just but what is expected of rivers.
- D. River banks and deltas are fertile land with rich nutrients supplied by occasional flooding.

13. How does an increase in the use of fossil fuels contribute to a global rise in temperature?

- A. It increases atmosphere’s ability to absorb energy from the sun.
- B. It increases levels of carbon dioxide.
- C. It decreases nitrogen levels in the atmosphere.
- D. It decreases atmosphere’s ability to radiate sun’s energy.

14. An increase in greenhouse gases has been linked to global rise in temperature. Which of these activities contribute to high concentration of greenhouse gases in the atmosphere?

- A. Storage of agricultural animal manure in tanks or pits.
- B. Use of Styrofoam products.
- C. Use of aerosol sprays.
- D. Abundance of mining activities.

15. Why would you likely feel a cold brush of air on mountaintops?

- A. Less heat is radiated from the surface to regions at higher altitude.
- B. Sky gets nearer at higher altitude thereby limiting entry of sun's radiation.
- C. Circulation of air brings cold air on.
- D. Insufficient data to explain the experience.

16. Below are the illustrations of what happened in different parts of the Philippines in a particular season of the year. What weather is characterized by the illustrations below?



- A. Amihan, moderate temperatures, little or no rainfall, and a prevailing wind from the east.
- B. Amihan, hot and humid weather, frequent heavy rainfall, and a prevailing wind from the west
- C. Habagat, moderate temperatures, little or no rainfall, and a prevailing wind from the east.
- D. Habagat, hot and humid weather, frequent heavy rainfall, and a prevailing wind from the west

17. The Philippines has been ranked as an investment grade country. A multinational agricultural firm will primarily consider in putting investment in a place in our country if

- A. there will be a lot of people in the place that will buy the product.
- B. the resources of the place meets the demand of the product and with minimal possibility of lost of investment due to natural disasters.
- C. the place will be providing very accessible routes to many of the possible markets
- D. they just feel investing anytime and anywhere as long as there is money.

18. You have invited via Facebook your long-time friend Alexis, a resident of Michigan, to visit your place. She is very excited yet very apprehensive at the same time having heard the news that the Philippines ranks # 3 as the most risky country to live on earth in terms of natural disasters. With that information, she's having in mind that there is no place in our country that is considerably safe. What can be the best strategy to convince her?

- A. Tell her that with the faith of the Filipino people, she will not be harmed.
- B. Assure her that your house is concrete and is very strong. Tell her that your family is really safety conscious.
- C. Send her links and data regarding hazard assessment, weather stability forecast and records of past calamities to hit your place.
- D. Let her decide by her own, you have invited her anyway.

19. When you plan to establish your own home in the future, which action is the most scientifically sound?

- A. Establish your home where most people live. The number is an assurance of safety.
- B. Build your home wherever you like as there is no 100% safe home. Just make sure you don't use sub-standard materials in the house construction.
- C. Live the decision to home developers. Their construction clearances to construct are always scientifically guaranteed. So any house in a subdivision wherever it is located is safe.
- D. Make a comparative research of geographical and topographical risks as well as natural calamity history of your prospect location before deciding to build your home.

20. You happen to pay a visit to a relative in the province. You have observed that living practices are simple. But the practice of burning their garbage to keep them from filling-up caught your attention. What can be your best mode of action?

- A. Never mind at all. Just respect their way of life as you are just a visitor of the place.
- B. Post- a "No Burning of Garbage" sign in visible places of the barangay.
- C. Offer to conduct a symposium explaining the impacts/damages of burning garbage to the environment.
- D. Ask the barangay captain to establish a land-fill.

GLOSSARY OF TERMS USED IN THIS LESSON:

Advection

Advection involves the transfer of **heat energy** by means of horizontal mass motions through a medium.

Aerosol

a suspension of particles, other than water or ice, in the atmosphere and ranging in size from approximately five nanometres to larger than ten microns in radius; may be either natural or caused by human activity and most of the latter are usually considered to be pollutants.

Air Pollutants

Substances which concentrations are high enough to be hazardous to humans, other animals, vegetation, or materials.

Atmospheric inversion

a condition occurring when a cool layer of air gets trapped below a layer of warm air and is unable to rise. This 'ceiling' leads to a build up of polluted air close to the ground and prevents vertical mixing and dispersion of smoke and other air pollutants.

Coordinate System

A system of representing points in a space of given dimensions by coordinates, such as the Cartesian coordinate system or the system of celestial longitude and latitude.

Conduction

The process by which heat energy is transferred directly from a warmer to a cooler substance, by molecular movement, e.g. from a warm ground surface to cooler air above it.

Convection

Heat transfer in which mass is exchanged. A net movement of mass may occur, but more commonly parcels with different energy amounts change places, so that energy is exchanged without a net movement in mass.

Deforestation

The change of forested lands to non-forest uses. This is often cited as one of the major causes of the enhanced greenhouse effect for two reasons: 1) trees that are burned or decompose release carbon dioxide; and, 2) trees that are cut no longer remove carbon dioxide from the atmosphere.

Exosphere

Region of the atmosphere beyond 400 km. that fades into interplanetary space.

Fossil Fuel

A general term for a fuel that is formed in the Earth from plant or animal remains, including coal, oil, natural gas, and tar sands.

Global warming

an increase in the earth's average atmospheric temperature that causes corresponding changes in climate and that may result from the greenhouse effect.

Greenhouse effect

a term used to describe the role of atmospheric trace gases - water vapor, carbon dioxide, methane, nitrous oxide, ozone, in keeping the earth's surface warmer than it would be otherwise;

Greenhouse gas

gas that absorbs infrared (thermal) radiation due to its chemical structure. Greenhouse gases absorb Earth's thermal energy as it radiates from the ground, through the atmosphere, out towards space. Examples of greenhouse gases include carbon dioxide, methane, and water vapor.

Longitude

The distance in degrees east or west of the prime meridian at 0° measured by the angle between the plane of the prime meridian and that of the meridian through the point in question, or by the corresponding time difference

Latitude

The angular distance north or south of the earth's equator, measured in degrees along a meridian, as on a map or globe.

Map

A representation, usually on a plane surface, of a region of the earth or heavens.

Globe

A sphere on which a map of the world or the heavens is drawn or represented

Typhoon

A violent tropical storm or cyclone, esp in the China seas and West Pacific

Natural Resources

The natural wealth of a country, consisting of land, forests, mineral deposits, water, etc.

Mesosphere

Region of the atmosphere, between approximately 50 to 100 km, in which temperature decreases with altitude

Ozone layer

a region in the stratosphere where there is ozone.

Ozone depletion

the process whereby the natural equilibrium between chemical reactions forming and destroying stratospheric ozone is disturbed by the release of manufactured chemicals.

Photochemical smog

air pollution caused by chemical reactions among various substances and pollutants in the atmosphere in the presence of sunlight; ozone is a major constituent.

Radiation

The transfer of energy (including heat and light) by electromagnetic waves of different wavelengths. Radiation is able to pass through gases, liquids, and solids or through a vacuum. Solar radiation is electromagnetic radiation emitted by the sun mainly as visible light, ultraviolet and infrared rays.

Thermosphere

Region of the atmosphere in which temperature increases with altitude. Located at approximately 100 to 400 km.

Troposphere

Lowest region of the atmosphere, defined by a steady decrease in temperature with altitude. Extends to approximately 15 km above Earth's surface.

Stratosphere

Portion of the atmosphere between the tropopause, at approximately 8 to 15 km, and 50 km in altitude, depending upon latitude, season, and weather.

REFERENCES AND WEBSITE LINKS USED IN THIS LESSON:

(For References, use MLA style to cite publications.

For Websites, state the URL and annotate or give the Website title. Arrange Websites according to their appearance in the module.

Provide other credits for multimedia materials such as images and sounds.)

<http://www.youtube.com/watch?v=FEE-PcNeLfo> – **Its more fun in the Philippines video showing the country’s rich natural resources.**

<http://geography.about.com/cs/latitudelongitude/a/latlong.htm> - **this offers a text on coordinate systems and the pertinent concepts such as latitude and longitude.**

<http://www.kidsgeo.com/geography-games/latitude-longitude-map-game.php> - **an interactive game for kids with the objective of finding a location in a community given two coordinate values**

<http://www.purposegames.com/game/longitude-and-latitude-quiz> - **an interactive game of identifying a location in a map with a given longitude and latitude values**

http://www.google.com.ph/imgres?imgurl=http://wikitravel.org/upload/shared//thumb/e/e4/Intramuros_map_captioned.png/400px- **intramuros map**

<http://geography.about.com/cs/latitudelongitude/a/latlong.htm> - **longitude and latitude reading material**

http://www.xn----9hciecaaawbbp1b1cd.com/image/users/155630/ftp/my_files - **map of philippine airlines international flights**

http://www.gglc.ph/gglc_whyphil.php#strategic-location – **information of airline destination’s travel time**

<http://focusweb.org/node/1271#sthash.y1BIBEbK.dpuf> - **a view of why Americans are after the Philippines strategic location**

http://www.goesr.gov/users/comet/tropical/textbook_2nd_edition/media/graphics/2004_NPacifc_tracks.jpg - **illustration showing typhoon tracks in the west pacific in the year 2004**

http://en.wikipedia.org/wiki/Typhoons_in_the_Philippines - **information of the Philippines most destructive typhoons in the past years.**

http://www.mindoro.com/i/maps/Ring-of-fire_280405.gif - **illustration presenting the coverage of Pacific Ring of Fire**

<http://global.britannica.com/EBchecked/topic/118426/Ring-of-Fire>
<http://www.sott.net/article/225907-Major-Ring-of-Fire-Events-Yet-To-Come> - **reading materials offering information about the ring of fire and the hazards associated with it**

http://images.gmanews.tv/v3/webpics/v3/2013/04/2013_04_01_11_00_39.jpg - **illustration depicting a fish market**

<http://cpscecotours.blogspot.com/2006/08/marine-biodiversity.html> - **text describing the Philippines as having the richest marine ecosystem in the world**

<http://library.wrdsb.ca/files/2010/03/ProsConsExample1.jpg> **pros and cons graphic organizer**

<http://www.gdc.govt.nz/assets/Files/EnvHealth/Education/Everything-comes-from-earth.pdf>
- **text on tracing the origin of different resources**

<http://www.youtube.com/watch?v=idc7mZ6naI0> – **video presentation on natural resources, their use and conservation**

<http://www.gdc.govt.nz/assets/Files/EnvHealth/Education/Everything-comes-from-earth.pdf>
- **text presenting classification of resources**

<http://www.youtube.com/watch?v=ncExXQitWLI> – **video on resource conservation**

<http://www.epa.gov/recyclecity/mainmap.htm> - **decision making game on community resource management and conservation**

http://hdn.org.ph/wp-content/uploads/DP_12_Tongson.pdf - **case study on watershed management and conservation in Sta. Rosa Philippines**

http://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/technical/?cid=nrcs143_026849, - **case studies of different United States conservation practices.**

http://education.nationalgeographic.com/education/encyclopedia/atmosphere/?ar_a=1&ar_r=3#page=2 – **(reader) contains discussion on the composition of the atmosphere as well as the various phenomena taking place in its different layers**

<http://greenliving.nationalgeographic.com/car-pollution-affect-environment-ozone-layer-20133.html> - **(reader) article on how car pollute the environment and the ozone layer.**

http://weather.about.com/gi/o.htm?zi=1/XJ&zTi=1&sdn=weather&cdn=education&tm=67&f=10&su=p284.13.342.ip_&tt=3&bt=0&bts=1&zu=http%3A//earthguide.ucsd.edu/earthguide/diagrams/energybalance/index.html - **animation about global energy balance**

http://weather.about.com/gi/o.htm?zi=1/XJ&zTi=1&sdn=weather&cdn=education&tm=34&f=10&su=p284.13.342.ip_&tt=3&bt=0&bts=1&zu=http%3A//earthguide.ucsd.edu/earthguide/diagrams/greenhouse/index.html - **simulation of global warming and greenhouse effect**

http://weather.about.com/gi/o.htm?zi=1/XJ&zTi=1&sdn=weather&cdn=education&tm=226&f=10&su=p284.13.342.ip_&tt=3&bt=0&bts=1&zu=http%3A//www.classzone.com/books/earth_science/terc/content/visualizations/es1903/es1903page01.cfm%3Fchapter_no%3Dvisualization – **land and sea breeze animation**

<http://www.epa.gov/climatechange/kids/scientists/proof.html> - **shows data on the current CO2 in the atmosphere**

<http://epa.gov/climatechange/kids/basics/today/greenhouse-effect.html> - **with video on global warming(learn the basics-today's climate change-greenhouse effect)**

<http://www.weatherwizkids.com/weather-wind.htm>

<http://dsc.discovery.com/convergence/everestbeyond/altitude/altitude.html>

<http://telstar.ote.cmu.edu/enviro/m3/s2/04solarad.shtml>- **article on global warming and ozone depletion**

<http://www.extension.iastate.edu/agdm/articles/others/TakApr08.html> - **shows how agricultural processes contribute to increasing GHG**