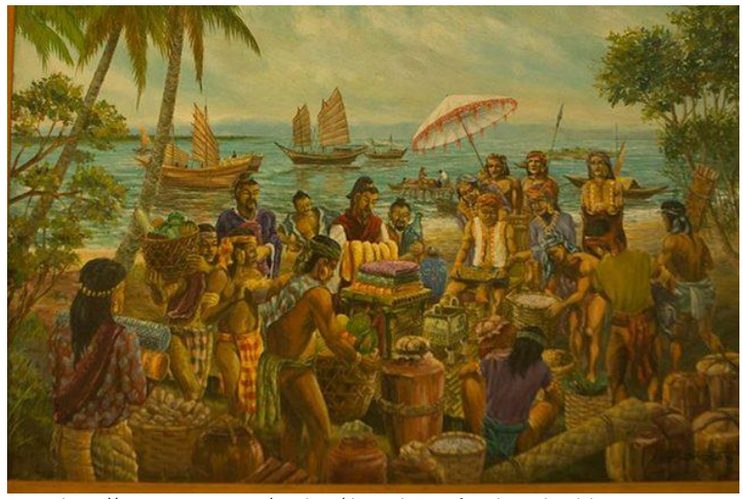
CHAPTER 3

Science, Technology, and Society: Philippine History

Chapter Outline

Historical Background of Science and Technology in the Philippines

- Pre Spanish Period
- Spanish Colonial Period
- American Period and Post-Commonwealth Era
- Marcos Era
- Fifth Republic



Source: https://www.timetoast.com/timelines/the-evolution-of-media-in-the-philippines-2a6e8df1-0455-4873-b9ea-1da1a1b0ea56

"*The growth and development of people is the highest calling of a leader"*

- John Maxwell

Learning Outcomes

At the end of this chapter, the students should be able to:

1. Explain the historical timeline of science and technology in the Philippines;

2. Analyse the development of science and technology in the Philippines; and

3. Synthesize and create their own understanding on the different periods of the history of science and technology in the Philippines.

SITUATION

Task (Class A and B) after reading the excerpt of President Duterte's SONA, write a one (1) page brief position paper explaining your thoughts about the action of the Philippine government in protecting our land territory and national sovereignty. Write your answer in one A4 bond paper. You may submit your answer in your respective GEC 17 Google classroom following the format: *(see the attached rubric on how you will be rated)*

Name: _____ Course and Year: _____ Date: _____

Excerpt from the 5TH STATE OF THE NATION ADDRESS OF
RODRIGO ROA DUTERTE
PRESIDENT OF THE PHILIPPINES
TO THE CONGRESS OF THE PHILIPPINES
[Delivered at the Session Hall of the House of Representatives, Batasang Pambansa Complex, Quezon City | 27 July 2020]

"Within ASEAN and beyond, the Philippines will continue to work with partners to address global perils and ramp up cooperation to secure for our peoples, greater peace, progress and prosperity.

The Filipino nation claims its rightful place in the community of sovereign states. Thus, we will continue to pursue an independent foreign policy. Let me be very clear about this.

May I cut my prepared speech? Alam mo, I read a little over three weeks or last month na the Americans would — intends to go back to Subic.

I will just put on record my thoughts. I have nothing against America, I have nothing against China but if you put bases here, you will double the spectacle of a most destructive thing just like Manila during the Second World War — during the retaking of this city. One of the most devastated cities in the world.

Kaya maglagay-lagay ka ng base at this time, this will ensure if war breaks out, because there would be atomic arsenals brought in, this will ensure the extinction of the Filipino race.

We worked without fail to protect our rights in the South China Sea, neither beholden nor a pawn to anyone. We broadened the boundaries of Philippine diplomacy. We built productive ties with everyone willing to engage us on the basis of equality and mutual respect. And, we redefined our relationships with our most important partners, placing the country in a far better position to advance our interests in an evolving regional order and emerging global problems. [applause]

Now, plenty of critics, both sides, claim about nothing has been done to retake forcefully or physically the South China Sea.

Alam mo, unless we are prepared to go to war, I would suggest that we better just call off and treat this, I said, with diplomatic endeavors.

China is claiming it. We are claiming it. China has the arms, we do not have it.

So, it is simple as that. They are in possession of the property. It will remain a property of a — if you're a lawyer, property rights.

They are — it has nothing to do with the Philippine Laws of Property but it's akin to — they are in possession. So what can we do? We have to go to war and I cannot afford it. Maybe some other president can, but I cannot. Inutil ako diyan, sabihin ko sa inyo. And I'm willing to admit it. Talagang inutil ako diyan. Wala akong magawa. I cannot…

The moment I send my Marines there at the coastal shores of Palawan, tinamaan ng cruise missile lahat iyan. Hindi pa nga naka-set sail iyan eh, sabog na.

The Philippines today is known to be a Third World Country. The development of science and technology will determine the socio-economic growth of the country. It is also a fact

that the national progress will relate the capacity of a country to produce local industrial goods for domestic needs.

It will greatly affect our economic growth through increasing the chances of foreign investors coming to our country and investing the products developed and invented by our local inventors. It could also indicate an increase in tourism by the foreign people to try products that our country has developed.

The continuous development in the field of science and technology could make a different history for the country. Supporting the programs that our government has built a better for the country to regain our status and glory to the global competition."

Historical Background of Science and Technology in the Philippines

Pre- Spanish Period

The Philippines has few written information with regards to its society, culture, and technology before the Spanish arrived. We relied on archaeological findings to trace the beginning of how the Filipinos lived with the use of science and technology.

These archaeological findings showed that modern man from Asian mainland first came over land on across narrow channels to live in Batangas and Palawan about 48,000 B.C. They settled in different areas across the country and made simple tools and weapons of stone flakes and later developed new skills like sawing and polishing stones.

During 3,000 B.C., they learned to produce adzes ornament of seashells and pottery that prosper for 2,000 years until competition arrived with the Chinese porcelains. Eventually they've learned how use metals as their tools and so-called ***Iron Age*** lasted until the 3rd century B.C to the 11th century A.D. during this time, Filipinos were involved in ore mining such as copper, gold, bronze, and iron.

Early Filipinos have also engaged themselves into weaving, shipbuilding, mining, and faming that led them in creating the finest products of engineering which is the Banaue Rice Terraces. Early Spanish chronicles also noted that early Filipinos build a refined plank-built warship called ***caracoa*** that well suited for inter-island trade.

Locales from Butauan were trading with Chinampa (Vietnam) and those from Ma-I (Mindoro) with China as seen on the Chinese records that contains several references to the Philippines. These records indicate that trading relationship have existed and established between the Philippines, China, and Vietnam.

Before the Spaniards came, Filipinos were already aware of activities and practices related to science and technology. They have learned the curative values of plants and able to extract the medicine out it. They had an alphabet, counting methods, weights, and measurement system, and the calendar that they based on the period of the moon.

Spanish Colonial Period

When the Spaniards colonized the Philippines, it has contributed the growth of science and technology in the country. They have introduced formal education and founded scientific institution. Parish schools were established where they taught religion,

reading, writing, arithmetic, and music. Natives were taught a more advance methods in agriculture. Later on, they have established colleges and universities around the country including the oldest university in Asia, Which is the University of Sto. Tomas.

Medicine was prioritized during the Spanish colonization, especially in the later years. Spaniards made contributions in the field of engineering by constructing government establishments, churches, roads, bridges and forts. Biology was highlighted during this period. Botanists, chemist, and medical scholars all gave contribution to the field of science.

The galleon trade made a big impact in the economic growth of the Philippines. Spaniards gave priority to the galleon trade sue to its potential to make huge profits. That is why agriculture and industrial development were not given focus and were neglected during this time. When ***Suez Canal*** was built, visiting each other countries for Europeans and Filipinos was made possible and probably influenced by the rapid development of scientific ideals brought by the Age of Enlightenment.

American Period and Post-Commonwealth Era

The Americans replaced Spaniards after they ruled the country and the progress of science and technology has continued under their rule. The establishment of Bureau of Government laboratories was made in July 1, 1901 by the Philippine Commission, which served a purpose to study the tropical disease and laboratory projects on the country, and was later on replaced by the Bureau of Science in 1905 that became the primary research center of the country. While on December 8, 1933, the National Research Council of the Philippines was established.

It was during the American period when science was inclined towards agriculture, food processing, forestry, medicine, and pharmacy, and not much focus were given on the development of industrial technology due to free trade policy with the United States that nurtured an economy geared towards agriculture and trade.

The Bureau of Science was replaced by the Institute of Science in 1946. In 1950, there were reports made by the US Economic Survey about the Philippines' problem with regards to science and technology such a lack of basic information, no support, minimal budget, and low compensation. During the regimen of Carlos P. Garcia in the 1958, the Philippine Congress passed the bill entitled "The Science Act of 1958" which goals is to establish the National Science Development Board.

Marcos Era

It was only during the Marcos Presidency where science was given importance. It was clearly stated by the former President in the Philippine Constitution, amended in 1973, that in term of national development, priority shall be given in the advancement of science and technology.

In his State of Nation Address, Marcos declared that there is a need for science in public high school and with the help of Department of Education in partnership from the National Science Development Board it aims to provide science-teaching equipment for a period of 4 years.

In 1968, he also recognized that technology was the top reason in economic development, and gave extra funds to support projects in applied science and science education. While in 1969, he allotted large amount of war damage funds to private

universities to encourage them to courses that focus on science and technology and research. In 1970, he emphasized that by upgrading the science curriculum and teaching equipment is crucial to the science development program.

Furthermore, he declared Presidential Decree No.49, series of 1972 as a support for promoting the scientific research and invention. Aside from that, one of his greatest contributions is the establishment of PAGASA which function is to give environmental protection and to utilize scientific knowledge to ensure the safety of the nation. He also established the National Academy of Science and Technology in 1976 to have a scientists whose experts in science and technology.

In 1986, he also established campuses of Philippine Science High School in the Visayas and Mindanao. It encourage the youth in theses area to choose a career in science and technology. It also aims to tap the potential students on the said regions.

Fifth Republic

After the term of President Marcos, Corazon Aquino replaced him in the presidential seat and on her term in 1986, she replaced the National Science and Technology Authority to Department of Science and Technology (DOST), giving the science and technology a seat in the government cabinet. It was during the Philippine Development Plan for the years 1987-1992 where the role of science and technology in the nature economy was highlighted. In 1990, Sate of Nation Address of President Corazon Aquino said that science and technology development should be on the top three priorities of the government to implement the development plan they have made.

In 1989, the budget allocation for science and technology was increased amounting into 1.054 billion pesos. But due to Asian financial crisis between the years 1990-1991, it was cut down by 14% and in 1992, it was increased again by 50%. She also encouraged Filipino scientists and inventors to put back Philippines and second in Japan when it comes to the field of science and technology. It was one on of her goals to make the country industrialized by the year 2000.

In July 1992, President Fidel V Ramos reported his State of the Nation Address that there were improvements with regards to science and technology. In his third SONA in 1994, he reported that there was a significant increase in people who specialize in the field of science and technology. By the year 1998, it was an estimated that the Philippines had 3,000competent scientists and engineers.

It was during the 5th Republic where the government provided 3,500 scholarships for students who are interested in taking up courses related to science and technology. Schools became modernized and updated by having additional high-tech equipment. It was also during this time when science and technology personnel were given priority by the government by approving the Republic Act No. 8439 in 1997 which entitled "***Magna Carta for science and technology Personnel"***. Its purpose is to give incentives and rewards to people who made an impact and influential in the field of Science and Technology.

In 1998, during President Joseph Estrada's term, the Internet age was pushed for the advancement of schools and industry. Then it was under the term of Gloria Macapagal-Arroyo when science and technology reached its golden age.

Numerous laws and projects related to science were made to push technology forward to increase the economic level of the country like R.A 9367 or the "biofuels" act that promotes the development and usage of biofuels throughout the country. In 2014,

President Benigno Aquino honors four scientist who gave huge contributions in the scientific field that geared towards the advancement of science and technology of the country.

SUUGESTED READINGS/WEBSITE/VIDEOS/FILM CLIPS

1. Moistero, A.P. (2006). *Science, technology and society. Manila:* Educational Publishing House

2. Scribd. (2010). *History of science and technology in the Philippines*. Retrieved from https://www.scribd.com/doc/36969608/4-7-B- History -of-Science-and-Technology-in-the-Philippines

3. Scribd. (2009). *Science, technology and society*. Retrieved from https://www.scribd.com/doc/23367406/LECTURE-NOTES-ON-INTRODUCTION-TO-SCIENCE-TECHNOLOGY-AND-SOCEITY

Activity 1

Directions: Classes A and B will make a **photo story** showcasing the historical timeline of scientific inventions in the Philippine history. *(A photo story, or photo essay, is a means of visual storytelling. Photojournalists use photo stories to narrate a series of images so that they give better insight into an event or topic).* On the other hand, class C will make a **collage** using ¼ cardboard depicting the evolutions of technology in our country. You may submit your answer in your respective GEC 17 Google classroom. *(Please refer to the attached rubric below on how you will be scored)*

Rubric in Photo Story

Criteria	10-8	7-5	4-2	1-0
Content/ Comprehensibility	All content is clearly comprehensible	Almost all content is comprehensible	Only some of the content is comprehensible	Content is minimally comprehensible
Language	Pronunciation and Grammar is excellent.	Pronunciation and Grammar is good.	Pronunciation and Grammar is acceptable.	Pronunciation and Grammar is non-acceptable.
Voice Quality	Well-rehearsed with smooth delivery that holds audience attention.	Rehearsed with a fairly smooth delivery that usually holds audience attention.	Delivery not smooth, but able to hold audience attention most of the time.	Delivery not smooth and audience attention lost.
Pictures	Perfectly aligns related pictures to enhance the presentation.	Aligns related pictures well to enhance to presentation.	Use of some pictures occasionally distracts from the presentation.	Unrelated pictures often distract from the presentation.
Music	Perfectly correlates to and enhances overall content	Does not quite correlate and/or is too noticeable	Distracts form content; is too overbearing	Entirely unrelated and completely overbearing
General	Includes all required pictures as well as title and source	Includes almost all required pictures as well as title and source	Lacks some required pictures and or title and source	Lacks large amount of required pictures and title and/or source

Source: Joachim Körner, 8/26/2020

Rubric in Scoring your Position Paper

Position Paper RUBRIC	5	4	3	2	1	Total
Strong Reasons	Position is supported with well-developed and thought out reasons (minimum of three). Reasons show strong analysis and conclusions based on the information.	Position is supported with well-developed and thought out reasons (minimum of three). Reasons are well developed, but analysis and conclusions need to be strengthened.	Position is supported with a minimum of three distinct reasons. Reasons are developed, but more analysis and conclusions are needed.	Position is supported with a minimum of three distinct reasons. Reasons are developed, but are more general and need to be developed further.	Reasons are weak and/or repetitive. They need to be developed and explained further.	
Depth and Variety of Evidence	Position is supported in depth with a variety of sources. Substantial valid and accurate information in the form of expert opinion, statistics, research studies, etc. has been used throughout the paper. Information is relevant and supports the writer's ideas.	Position is supported with a variety of sources. Adequate valid and accurate information has been used throughout the paper. Information is relevant and supports the writer's ideas.	Position is supported with a variety of sources. Valid and accurate information has been used throughout the paper. Most of the information is relevant and supports the writer's ideas. A mix of general and specific information is used.	Position needs to be supported with more valid and accurate information. Some of the information may not be relevant and/or does not support the thesis.	Paper lacks valid and accurate information. Some of the information is not relevant and does not support the position.	
Organization and Mechanics	Ideas are well organized and free of mechanical errors.	Most ideas are well organized and free of mechanical errors.	Organization of the paper needs to be strengthened. Mechanical errors are present throughout the paper.	Paper has some organization but some diversions or abrupt shifts in purpose are present. Many mechanical errors are present as well. Sentence structure needs to be strengthened.	Paper has little organization and many diversions, often shifting in purpose. Many mechanical errors are present and transitions are not utilized.	
Transitions	Transitional words and phrases are used to connect ideas and maintain coherence between paragraphs.	Some transitional words and phrases are used to connect ideas and maintain coherence between paragraphs.	Too few transitions used, or used correctly.	Too few transitions used.	Attempts made to use appropriate transitions.	

Collage Rubric

CATEGORY	10-8	7-5	5-2	1-0
Creativity	All of the graphics or objects used in the collage reflect a degree of student creativity in their display.	Most of the graphics or objects used in the collage reflect student creativity in their display.	Only a few graphics or objects reflect student creativity, but the ideas were typical rather than creative.	None of the graphics or objects reflects student creativity.
Design	Graphics are cut to an appropriate size, shape and are arranged neatly. Care has been taken to balance the pictures across the area. Items are glued neatly and securely.	1-2 graphics are lacking in design or placement. There may be a few smudges or glue marks.	3-4 graphics are lacking in design or placement. Too much background is showing. There are noticeable smudges or glue marks.	Graphics are not an appropriate size shape. Glue marks evident. Most of the background is showing. It appears little attention was given to designing the collage.
Time and Effort	Much time and effort went into the planning and design of the collage. It is clear the student used class time efficiently.	Class time was used wisely. Student could have put in more time and effort.	Class time was not always used wisely.	Class time was not used wisely and the student put in no additional effort.
Attention to Theme	The student gives a reasonable explanation of how every item in the collage is related to the assigned theme. For most items, the relationship is clear without explanation.	The student gives a reasonable explanation of how most items in the collage are related to the assigned theme. For many of the items, the relationship is clear without explanation.	The student gives a fairly reasonable explanation of how most items in the collage are related to the assigned theme.	The student's explanations are weak and illustrate difficulty understanding how to relate items to the assigned theme.
Presentation	The student speaks clearly, with confidence and poise. Completely conveys message of collage as it relates to personal style choices.	The student speaks clearly, with confidence and poise. Reasonably conveys message of collage as it relates to personal style choices.	The student somewhat speaks clearly, with confidence and poise. Somewhat conveys message of collage as it relates to personal style choices	The student does not speak clearly, without confidence and poise. Does not convey message of collage as it relates to personal style choices

Source: Collage Rubricwww.neshaminy.org