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A proposed module in enhancing reading comprehension difficulties in science for the high school students in the Philippines

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Abstract

The 2018 research conducted by the Programme for International Student Assessment (PISA) found that the Philippines ranked the lowest in terms of Reading Comprehension with 340 points. This is the lowest score in all countries surveyed. Aside from reading comprehension, the Philippines ranked second to the lowest in Science and Mathematics. This study proposed a module that can possibly bridge the gap between difficulties in reading comprehension and science subjects for the high school students in the Philippines. The proposed module contains topics regarding identifying main ideas and supporting details, summarizing, and reading comprehension test.

Keywords: Philippine Education; DepEd Philippines; Reading Comprehension; Science Education Philippines; PISA 2018

1. Introduction

Using appropriate technology and devices will help students improve their reading comprehension. Reading comprehension is essential for understanding written communication in the workplace, at school, and in everyday life, according to Helmers (2017). Numerous hours have been spent by teachers and other scholars testing methods to improve students' comprehension skills. Many of these tactics have been used for a long time. Reading comprehension is a life skill that students can learn at a young age. Teachers can help students develop lifelong learning skills by providing them with useful resources. Students will learn for the rest of their lives if teachers provide them with the necessary resources. Students will prosper for the rest of their lives if they learn

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understanding by using resources at a young age. Educators also overlook how difficult it is for a small brain to understand too many concepts. Giving students the resources, they need to learn will help them remember knowledge for longer. Reading comprehension is a requirement for academic success.

Building students' context awareness is an essential part of improving their reading comprehension. Readers must be able to communicate with the text in order to make sense of it. Readers would be forced to keep details if they make links with the document. Readers will need a lot of background information on the subject. The reader will make meaningful mental representations about the text if they have domain-specific or topical information. When it comes to reading comprehension, background information is critical because it helps students choose from various word definitions, choose relevant data, and draw inferences about the text. Before reading, students must have a clear base of background information about the subject to fully comprehend the text (Schwanenflugel,& Knapp, 2018).

The use of vocabulary is a second important method for improving reading comprehension. Vocabulary is critical since students must fully comprehend the vocabulary to retain the information being read. The explanation of vocabulary benefits all students in a classroom setting, but the struggling readers benefit the most. Context hints will help figure out which words are tricky. Context hints are critical for both broad understandings of the text and specific learning of new words (Flanigan & Greenwood, 2007). Educators must model how to sort out common and foreign words for background cues to aid reading comprehension. It means teaching students the essential terms in the text and using background cues to teach the words that do not have a clear relation. Vocabulary and reading comprehension go hand in hand, and when appropriately combined with background clues, this method will help many students **(**Hirsh-Pasek et al., 2015) .

Another excellent way to improve reading comprehension is to read aloud. Reading comprehension can be challenging for young children; reading aloud allows them to learn aloud as well. Teachers and parents can hear how students are interpreting the story, finding information, examining vocabulary, and adults can hear the comprehension techniques they are using by thinking aloud. The students will hear an outstanding model of fluent reading, whether the teacher or a parent reads it. Students should listen to a story and learn about it at a higher level. When they are read to, they can process the information and have in-depth discussions about the text (Gold & Gibson, 2001). Educators must set aside time for preparation and setup for comprehension skills to develop. Thinking, listening, and debate should all be encouraged in the classroom. Reading aloud is another excellent way for students to improve their reading comprehension.

Another method for improving reading comprehension is interactive learning environments. Students who collaborate will learn more effectively. Within a classroom, collaborative learning environments are areas where students can work together. "Collaborative learning" is an educational approach in which students of varying abilities work together in small groups to achieve a shared goal **(**Gokhale, 1995). Students are responsible for their learning and the learning of their community members in a shared learning environment. When peers collaborate, they may feel accomplished as a group. Students may use analytical thinking skills at a higher level as part of a peer team, and they are more secure with numbers. Students should use higher-level thinking skills like interpreting, synthesizing, and assessing in a collaborative environment. Because of the top-level thinking, students would understand the text better and improve their comprehension skills by working as a collective peer team. Reading comprehension can be improved by collaborative learning.

Finally, technology can be used to help students improve their reading comprehension. Educators and students alike are heavily reliant on technology. Over the past decade, technology has advanced dramatically, and it is now being used in schools worldwide. When used appropriately, technology will improve many aspects of the curriculum. The use of technology in the classroom will help students improve their reading comprehension. Technology is most beneficial when it is integrated into the curriculum and regularly used in the classroom. Many technological options are available today to help students improve their learning skills, expand their learning, or promote their learning (Texas Education Agency, 2002). When used as a guide, technology applications have been shown to aid reading comprehension. Students are inspired by technology devices and want to use something already part of their everyday routine. Technology is a helpful and useful tool for learners, especially it can help children with disabilities to participate more in their classes **(**Murphy et al., 2003). Students need the opportunity to use and learn from a motivating method. Allowing students to guide their learning and select materials to read begins with providing opportunities for students to practice their reading skills using available technology resources (Castellani & Jeffs, 2001). If technology is regularly and efficiently integrated into the curriculum, it can improve students' reading comprehension skills. Students may use technology to access software that provide them with context information on a text. Apps can also assist students in determining the meaning of vocabulary words, and technology can read text aloud to them, both of which have been shown to improve comprehension skills provides. Technology has proven to be an effective method for improving students' reading comprehension.

Educators are exposed in so much pressure to get every child up to grade level in reading. Reading comprehension is a necessary ability for academic achievement for all students. Teachers should provide students with a variety of resources to help them feel

successful in the classroom. Comprehension is an essential skill for students to succeed in the workplace, in school, and in everyday life. Students' reading is pointless, meaningless, and frustrating if they do not understand what they are reading (Texas Education Agency, 2002). The stakes for producing great readers are high but reading comprehension skills can be developed effectively with the right resources.

2. Method

This research proposed a module to enhance the reading comprehension skills of high school students in science. The module planning consisted of two stages:

Stage 1: The researcher consulted several science teachers in the Senior High School to expound on and share the common issues and problems they face in teaching science. These problems will be the basis for the proposal of the module. Also, the documents from DepEd, such as the Curriculum guide and teaching plans, were analyzed to give a more profound problem analysis within the science education in the senior high school.

Stage 2: The module will be presented to several research teachers and ask for comments and suggestions for further development of the framework.

The results from the consultation with the science teachers were observed and gathered using the narrative research strategy and were analyzed using descriptive analysis. The researcher analyzed, organized, and summarized the effect and created themes that can answer the research questions. The results were used to draft the module presented to faculty members. The module is revised and further developed based on the suggestions, recommendations, and comments.

3. Results

One of the most crucial language skills to acquire both inside and outside the classroom is reading. It is also one of the most popular methods of obtaining information. According to Trilanti (2013), when reading, the reader engages a variety of specialized abilities, and their effectiveness in comprehending the content of what they see is mainly dependent on these talents. Reading skills include extracting specific images, obtaining detailed images, extracting certain information and discourse patterns, and deducing meaning from context. Furthermore, according to Westwood (2008), competent reading is a highly complex ability requiring numerous processes. To summarize, learning to read is a complex process that necessitates the acquisition of specialized skills.

The first step in acquiring knowledge is to read. Reading is a crucial issue that is enjoyable and necessary; it is the fundamental tool of education. Reading is a complex subject to study since it requires the reader to deduce ideas from a book based on its

perspective. Reading, according to Ur (1996), entails "reading and comprehension." She also makes the following assumptions about the nature of reading: we need to perceive and decode letters to read words; we need to understand all of the terms to understand the meaning of a text; the more symbols (letters and words) in a text, the longer it will take to read it; we gather meaning from what we read; our understanding of a text comes from understanding the underlying structure of the text.

According to Kalayo (2007), reading is an interactive process between the reader and the text that results in comprehension. The text contains meaning-encoding characters, words, phrases, and paragraphs. To figure out what the meaning is, the reader use knowledge, skills, and methods. As a result, reading is a form of communication between a reader and a written text. The readers should apply their knowledge to comprehend the text's substance.

According to Afiki (2017), understanding is the process of determining the intended meaning of written or spoken communication. The process of making sense of words, sentences, and interrelated material is known as comprehension. Comprehension must be the primary focus of reading instruction for youngsters, rather than emphasizing something just after they have learned to decode and recognize words. Reading comprehension is a "construction process" because it requires all aspects of the reading process to work together as a text, read to generate a mental image of the text. Reading comprehension is, in theory, a process in which the reader interacts with the text to construct meaning or a process in which the reader generates sense by engaging with the text.

Reading comprehension is thought to occur at four degrees of complexity, according to Smith in Westwood. These are the levels:

a. Literal comprehension: reading is the process of comprehending, remembering, or recalling the explicit information included in a chapter.

b. Inferential comprehension: leveraging the reader's experience and intuition, as well as inferring, to locate information that is not expressly stated in a paragraph.

c. Evaluative or critical comprehension: reading is the process of comparing information in a passage to the reader's knowledge and beliefs.

d. Appreciative comprehension: reading aims to elicit an emotion or other valuable reaction from a passage.

Reading comprehension has been described as a "complex intellectual process requiring several abilities," according to Westwood (2008). Readers must filter, evaluate, organize, reflect on, and develop associations with new information on the page using previously acquired knowledge. To comprehend literature, a reader must quickly recognize words, grasp almost all of the terms, and connect units of meaning into a coherent message. Adequate comprehension necessitates the reader's ability to preserve

the importance of the text throughout the reading process. According to Kilinger (2015), reading comprehension entails much more than readers' responses to the text. Reading comprehension is a multi-faceted, extremely complicated process that involves various interactions between readers and what they bring to the text (prior knowledge, method use) and variables linked to the text itself (text interest, text type understanding). Finally, reading comprehension might be defined as the process of extracting meaning from written material. As a result, reading comprehension is a complicated process in which a reader attempts to reassemble a message written in pictorial language. It is a dialogue between the author and the reader.

The developed module has 3 units, and these are (1) identifying main ideas and supporting details, (2) summarizing, and (3) reading comprehension test. The Module for Enhancing Reading Comprehension in Science for the High School Students in the Philippines is presented below from page 1 to its references.

MODULE FOR ENHANCING READING COMPREHENSION IN CORE SCIENCE SUBJECTS

Developed by: RENELLE V. CARAIG

Objectives:

At the end of the module the students should be able to:

1. enhance their skills in Reading Comprehension in Core Science Subjects using:
   - -Identifying main ideas and supporting details
   - -Summarizing
2. read and answer science literature with the following parts:
   - -Pre-test
   - -Reading Comprehension test
   - -Practice Exercise

UNIT 1: IDENTIFYING MAIN IDEAS AND SUPPORTING DETAILS

PRE-TEST

Directions: Read the following paragraph and use it to answer pretest questions 1-4. When you are done, you may use page 8 to check your answers.

> Plants are considered as autotrophic organisms. Autotrophic are organisms that can produce their own energy. Plants undergo to the process of photosynthesis. Photosynthesis requires carbon dioxide, water, and sunlight. It occurs in the chlorophyll of the plants. As autotrophs, plants do this process to survive and preserve their species.

1. What is the main idea of this paragraph?

a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Photosynthesis occurs in the chlorophyll.
d. Plants are considered as autotrophic organisms.

2. Which term best describes the main idea of a piece of writing?

a. A detail
b. A central point
c. A broad topic
d. An aspect

3. Which term best describes the supporting details of a piece of writing?

a. Structure
b. Substance
c. Majority
d. Descriptive

4. Which of the following is a supporting detail of this paragraph?

a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Autotrophic are organisms that can produce their own energy.
d. Plants are considered as autotrophic organisms.

MAIN IDEAS AND SUPPORTING DETAILS

- ✓ The **main idea** in a paragraph is the most important idea. It is the central point that an author is trying to get across to the reader.
- ✓ The **supporting details** describe the main idea. They make the main idea stronger and clearer.
- ✓ Keep in mind that the main idea is often the first or last sentence of a paragraph.
- ✓ To find the main idea, answer two questions:

(1) What is the paragraph mostly about?
(2) Which sentence best tells what the paragraph is about?

Example:

Mother gorillas do a lot for their babies. They nurse their babies. They protect them from danger. And they teach the tiny gorillas how to get along with other gorillas.

(1) The paragraph is mostly about what mother gorillas do.

(2) The first sentence tells what the paragraph is about. It is the main idea.

Main Idea

Mother gorillas do a lot for their babies.

Supporting Detail #1

They nurse their babies.

Supporting Detail #2

They nurse their babies
They protect them from danger.

Supporting Detail #3

And they teach the tiny gorillas how to get along with other gorillas.

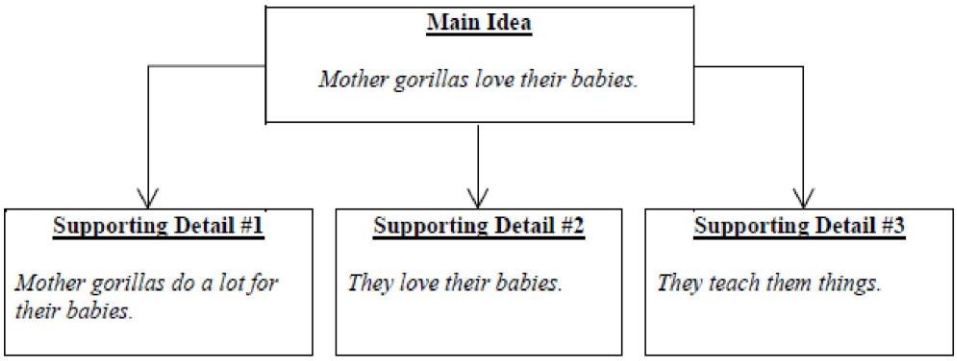
MAIN IDEAS AND SUPPORTING DETAILS

Non-Example:

Mother gorillas do a lot for their babies. They nurse their babies. They protect them from danger. And they teach the tiny gorillas how to get along with other gorillas.

(1) The paragraph is mostly about mother gorillas.

(2) Not sure which sentence best tells what the paragraph is about.



- ✓ In this case, the main idea that is stated in the box is a broad and generalized statement about mother gorillas. It is not the main idea. This statement also cannot be found within the paragraph.

- ✓ The supporting details do not support the main idea. They are made up and cannot be found within the paragraph. Lastly, the supporting details neither make the main idea stronger nor does it make it any clearer.

Now it's time to show what you have learned!
Please move on to the practice test section of the module.

PRACTICE TEST

Directions: Read the following paragraph and use it to answer pretest questions 1-4. When you are done, you may use pages 8-9 to check your answers.

> Plants are considered as autotrophic organisms. Autotrophic are organisms that can produce their own energy. Plants undergo to the process of photosynthesis. Photosynthesis requires carbon dioxide, water, and sunlight. It occurs in the chlorophyll of the plants. As autotrophs, plants do this process to survive and preserve their species.

1. Which of the following is a supporting detail of this paragraph?

a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Autotrophic are organisms that can produce their own energy.
d. Plants are considered as autotrophic organisms.

2. Which term best describes the main idea of a piece of writing?

a. A detail
b. A central point
c. A broad topic
d. An aspect

3. What is the main idea of this paragraph?

a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Photosynthesis occurs in the chlorophyll.
d. Plants are considered as autotrophic organisms.

4. Which term best describes the supporting details of a piece of writing?

a. Structure
b. Substance
c. Majority
d. Descriptive

POST-TEST

Directions: Read the following paragraph and use it to answer pretest questions 1-4.
When you are done, you may use page 9 to check your answers.

> The trophic level of an organism is the position it occupies in a food web. A food chain is a succession of organisms that eat other organisms and may, in turn, be eaten themselves. The trophic level of an organism is the number of steps it is from the start of the chain. A food web starts at trophic level 1 with primary producers such as plants, can move to herbivores at level 2, carnivores at level 3 or higher, and typically finish with apex predators at level 4 or 5. The path along the chain can form either a one-way flow or a food "web". Ecological communities with higher biodiversity form more complex trophic paths.

1. What is the main idea of this paragraph?

a. The path along the chain can form either a one-way flow or a food "web".
b. The trophic level of an organism is the number of steps it is from the start of the chain.
c. The trophic level of an organism is the position it occupies in a food web
d. Ecological communities with higher biodiversity form more complex trophic paths.

2. The best definition of supporting details would be…

a. Important information that talks more about the overall idea of a piece of writing.
b. Sentences that make the main idea stronger and clearer.
c. The sentences that make up the bulk of a paragraph in a piece of writing.
d. Details that support other details.

3. Which of the following is a supporting detail of this paragraph?

a. The path along the chain can form either a one-way flow or a food "web".
b. The trophic level of an organism is the number of steps it is from the start of the chain.
c. The trophic level of an organism is the position it occupies in a food web
d. Ecological communities with higher biodiversity form more complex trophic paths

4. The best definition of main idea would be…

a. Important information that talks more about the overall idea of a piece of writing.
b. What a piece of writing is mostly about.
c. What someone is primarily talking about.
d. A vague idea that is supported by very specific details.
.

ANSWER KEYS FOR PRE-TEST, PRACTICE TEST, AND POST-TEST

A. PRE-TEST

1. What is the main idea of this paragraph?
a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Photosynthesis occurs in the chlorophyll.
d. Plants are considered as autotrophic organisms- CORRECT

2. Which term best describes the main idea of a piece of writing?
a. A detail
b. A central point- CORRECT
c. A broad topic
d. An aspect

3. Which term best describes the supporting details of a piece of writing?
a. Structure
b. Substance- CORRECT
c. Majority
d. Descriptive

4. Which of the following is a supporting detail of this paragraph?
a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Autotrophic are organisms that can produce their own energy- CORRECT
d. Plants are considered as autotrophic organisms.

B. PRACTICE TEST

1. Which of the following is a supporting detail of this paragraph?

a. Plants need to survive.

b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Autotrophic are organisms that can produce their own energy- CORRECT
d. Plants are considered as autotrophic organisms.

2. Which term best describes the main idea of a piece of writing?
a. A detail
b. A central point- CORRECT
c. A broad topic
d. An aspect

3. What is the main idea of this paragraph?
a. Plants need to survive.
b. Photosynthesis requires carbon dioxide, water, and sunlight.
c. Photosynthesis occurs in the chlorophyll.
d. Plants are considered as autotrophic organisms- CORRECT

4. Which term best describes the supporting details of a piece of writing?
a. Structure
b. Substance- CORRECT
c. Majority
d. Descriptive

C. POST-TEST

1. What is the main idea of this paragraph?
a. The path along the chain can form either a one-way flow or a food "web".
b. The trophic level of an organism is the number of steps it is from the start of the chain.
c. The trophic level of an organism is the position it occupies in a food web- CORRECT
d. Ecological communities with higher biodiversity form more complex trophic paths.

2. The best definition of supporting details would be…
a. Important information that tells more about the overall idea of a piece of writing.
b. Sentences that make the main idea stronger and clearer- CORRECT
c. The sentences that make up the bulk of a paragraph in a piece of writing.
d. Details that support other details.

3. Which of the following is a supporting detail of this paragraph?

a. The path along the chain can form either a one-way flow or a food "web".

b. The trophic level of an organism is the number of steps it is from the start of the chain.

c. The trophic level of an organism is the position it occupies in a food web

d. Ecological communities with higher biodiversity form more complex trophic paths- CORRECT

4. The best definition of main idea would be…

a. Important information that talks more about the overall idea of a piece of writing- CORRECT

b. What a piece of writing is mostly about.

c. What someone is primarily talking about.

d. A vague idea that is supported by very specific details.

UNIT 2: SUMMARIZING

PRE-TEST

Directions: Read the passage below about methamphetamine, an illegal drug called "meth." (The word seductive in the title means "tempting" or "attracting with the promise of pleasure."). Write a summary from the passage read. When you are done, you may use page 14 to check your answers

The Seductive, Destructive Power of Meth

Government health officials and doctors don't like to talk about it. The major reason meth (methamphetamine) hooks people is that it increases their sex drive and performance—for a short while, anyway. It is even more powerful than cocaine in this respect. Dr. Mary Holley of Alabama interviewed meth addicts. Both men and women said the effect on sex was the number one reason they used the illegal drug.

After about six months, meth addicts can't have sex unless they're high, and after a while longer, they're unable to have sex at all. At first, meth fires up the dopamine system in the brain. After a while, it burns it out. Once that happens, the person no longer functions sexually.

Besides causing brain damage, meth has other nasty effects. Paranoia is common. Some meth addicts hallucinate. Others become violent. Users who inject meth risk contracting HIV and hepatitis C, a life-threatening liver disease. Those who share needles are also at risk for other sexually transmitted diseases. Meth users' hair and teeth eventually fall out. The nation's prisons are filled with former meth users whose teeth are crumbling. The prisons cannot afford the dental treatment for them.

Meth use has reached epidemic proportions and affects every part of the country. Meth use is rampant in big cities and small towns, and even in rural areas. A 2002 survey by the National Institute on Drug Abuse revealed that about 5 percent of Americans at least 12 years old have tried meth at least once. This shocking statistic translates into more than 12 million people.

YOURSUMMARY:

_____
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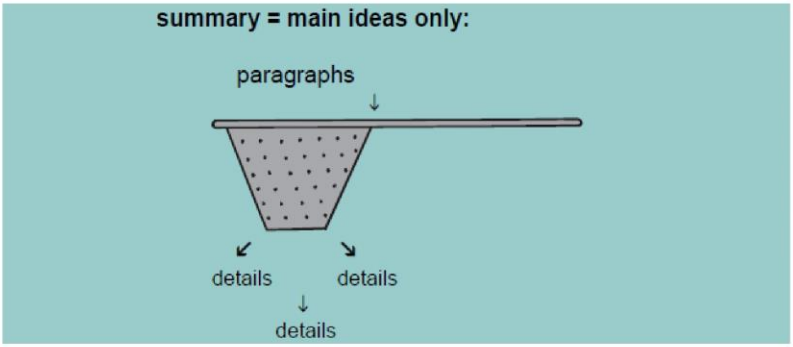
SUMMARIZING

How to Write a Summary?

1. Read a text passage at least twice. Read it the first time to get a general overview and to see how the information is organized.

2. Reread each paragraph to determine what is most important in it. You cannot decide whether something is more important or less important until you have read what comes before *and after it.* When you are reading material for the first time, you know about the sentence you are reading and what came before it, but you cannot know at that moment what comes after it. This is why you need a second reading once you have the general picture.

- It may help you to start by identifying the information that is *unimportant* or that is *repeated*. Since you're going to leave it out of the summary, you may want to lightly pencil through this material.
- Replace any lists of specific things with a *general* word that describes them all (such as using "childhood diseases" in place of "mumps, measles, and chicken pox").
- Locate any stated main ideas and underline them. For any paragraph that does not have a stated main idea, formulate the main idea. Write its implied main idea in the margin of the textbook, on scratch paper, or on a sticky note. Remember that you may have to combine important information to create a main idea.



SUMMARIZING

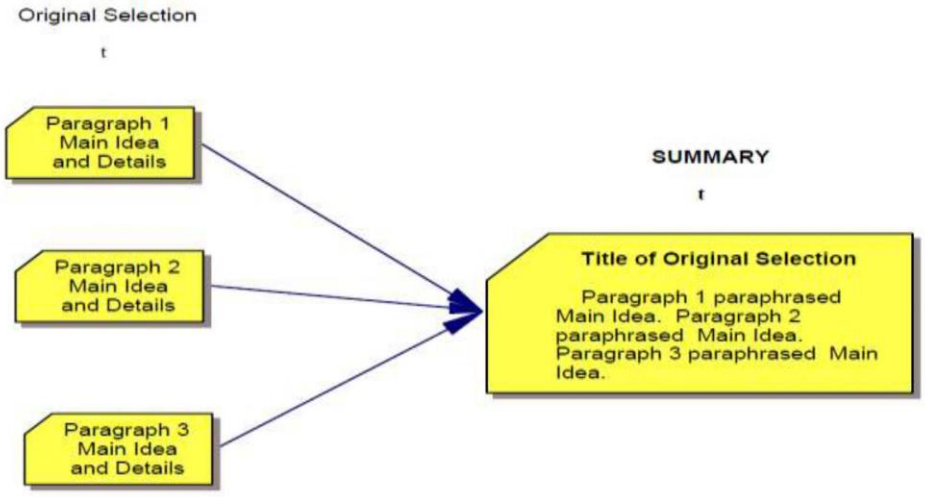
3. Rewrite the main ideas in your own words as briefly as possible.
When you paraphrase or substitute synonyms for existing words, you use your brain to process the material. The original material might say "a ten-year period," but in your summary you might say "decade" instead. Although main ideas are typically written as single sentences, you may sometimes find it easier to break them into two or more sentences in your summary. Students usually write summaries as study tools, so make yours work for you.

4. Write the paraphrased main ideas in the same order the author presents the main ideas.

5. Use transition words as needed to show how the ideas are linked and to make your summary read more smoothly.

6. Give your summary the same title as the title of the material you are summarizing. Here are the steps applied to the sample passage. (Notice that in the summary of the meth passage, the main points have been paraphrased.)

The diagram below illustrates where material for a summary comes from. A summary for a three-paragraph selection would present the three paraphrased main ideas, although a summary can also include essential details.



PRACTICE TEST

Directions: Read the passage entitled body tissues, organs, and systems
Write a summary from the passage read.

Body Tissues, Organs, and Systems

Tissue consists of millions of cells that are grouped together to perform a specific function in the body. Muscle tissue, for example, is one particular type of tissue. It consists of millions of threadlike muscle cells. In addition to muscle tissue, there are three other basic types of tissue: nerve, epidermal (skin), and connective tissue.

Organs are composed of different types of tissues that work together to carry out a specific body function. For instance, the heart is an organ that consists of muscle tissue, connective tissue, and nerve tissue. Because these tissues work together, the organ of the heart is able to pump and circulate blood throughout the body. Other examples of organs are the eyes, liver, and kidneys. The skin is the largest organ of the body.

Systems consist of organs that work together. The systems of the body include the digestive system, nervous system, skeletal system (bones), muscular system, respiratory system (breathing), endocrine system (glands), excretory system (waste removal), reproductive system, and circulatory system. The organs that work together as the digestive system are the mouth, gullet, stomach, and intestines. Together the brain, spinal cord, and nerves throughout the body function as the nervous system.

YOURSUMMARY:

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ANSWER KEY FOR PRE-TEST

CORRECT ANSWER:

The Seductive, Destructive Power of Meth

The main reason people get hooked on meth (methamphetamine) is that it boosts their sex drive and performance, but only temporarily. After about half a year, meth users can only have sex when they're high, and later on, they can't have sex at all. In addition, meth causes brain damage and has other terrible effects. Meth use has become a nationwide epidemic.

The Seductive, Destructive Power of Meth

~~Government health officials and doctors don't like to talk about it.~~ The major reason meth (methamphetamine) hooks people is that it increases their sex drive and performance—for a short while, anyway. ~~It is even more powerful than cocaine in this respect. Dr. Mary Holley of Alabama interviewed meth addicts. Both men and women said the effect on sex was the number one reason they used the illegal drug.~~

After about six months, meth addicts can't have sex unless they're high, and after a while longer, they're unable to have sex at all. ~~At first, meth fires up the dopamine system in the brain. After a while, it burns it out. Once that happens, the person no longer functions sexually.~~

Besides causing brain damage, meth has other nasty effects. ~~Paranoia is common. Some meth addicts hallucinate. Others become violent. Users who inject meth risk contracting HIV and hepatitis C, a life threatening liver disease. Those who share needles are also at risk for other sexually transmitted diseases. Meth users' hair and teeth eventually fall out. The nation's prisons are filled with former meth users whose teeth are crumbling. The prisons cannot afford the dental treatment for them.~~

Meth use has reached epidemic proportions and affects every part of the country. ~~Meth use is rampant in big cities and small towns, and even in rural areas. A 2002 survey by the National Institute on Drug Abuse revealed that about 5 percent of Americans at least 12 years have tried meth at least once. This shocking statistic translates into more than 12 million people.~~

Here's an explanation:

Paragraph 1: Second sentence is the stated main idea. Other sentences contain the less important details.
Paragraph 2: First sentence is the stated main idea. The other sentences are details that explain the reason for meth's effects over time.
Paragraph 3: First sentence is the stated main idea. The rest of the sentences are details that tel some of the specific "nasty effects" of meth use.
Paragraph 4: First sentence is the stated main idea. The second sentence repeats the information in the first sentence. The rest of the sentences are details that give specific information about how widespread meth use is.

UNIT 3:
READING COMPREHENSION TEST

Direction: Read the passage below entitled "History of Cell Biology". Then answer the following questions.

The cell theory, or cell doctrine, states that all organisms are composed of similar units of organization, called cells. The concept was formally articulated in 1839 by Schleiden & Schwann and has remained as the foundation of modern biology. The idea predates other great paradigms of biology including Darwin's theory of evolution (1859), Mendel's laws of inheritance (1865), and the establishment of comparative biochemistry (1940).

First Cells Seen in Cork

While the invention of the telescope made the Cosmos accessible to human observation, the microsope opened up smaller worlds, showing what living forms were composed of. The cell was first discovered and named by Robert Hooke in 1665. He remarked that it looked strangely similar to cellula or small rooms which monks inhabited, thus deriving the name. However what Hooke actually saw was the dead cell walls of plant cells (cork) as it appeared under the microscope. Hooke's description of these cells was published in *Micrographia*. The cell walls observed by Hooke gave no indication of the nucleus and other organelles found in most living cells. The first man to witness a live cell under a microscope was Anton van Leeuwenhoek, who in 1674 described the algae Spirogyra. Van Leeuwenhoek probably also saw bacteria.

Formulation of the Cell Theory

In 1838, Theodor Schwann and Matthias Schleiden were enjoying after-dinner coffee and talking about their studies on cells. It has been suggested that when Schwann heard Schleiden describe plant cells with nuclei, he was struck by the similarity of these plant cells to cells he had observed in animal tissues. The two scientists went immediately to Schwann's lab to look at his slides. Schwann published his book on animal and plant cells (Schwann 1839) the next year, a treatise devoid of acknowledgments of anyone else's contribution, including that of Schleiden (1838). He summarized his observations into three conclusions about cells:

1. The cell is the unit of structure, physiology, and organization in living things.
2. The cell retains a dual existence as a distinct entity and a building block in the construction of organisms.
3. Cells form by free-cell formation, similar to the formation of crystals (spontaneous generation).

We know today that the first two tenets are correct, but the third is clearly wrong. The correct interpretation of cell formation by division was finally promoted by others and formally enunciated in Rudolph Virchow's powerful dictum, *Omnis cellula e cellula*,: "All cells only arise from pre-existing cells".

Modern Cell Theory

1. All known living things are made up of cells.

2. The cell is structural & functional unit of all living things.
3. All cells come from pre-existing cells by division. (Spontaneous Generation does not occur).
4. Cells contains hereditary information which is passed from cell to cell during cell division.
5. All cells are basically the same in chemical composition.
6. All energy flow (metabolism & biochemistry) of life occurs within cells.

As with the rapid growth of molecular biology in the mid-20th century, cell biology research exploded in the 1950's. It became possible to maintain, grow, and manipulate cells outside of living organisms. The first continuous cell line to be so cultured was in 1951 by George Otto Gey and coworkers, derived from cervical cancer cells taken from Henrietta Lacks, who died from her cancer in 1951. The cell line, which was eventually referred to as HeLa cells, have been the watershed in studying cell biology in the way that the structure of DNA was the significant breakthrough of molecular biology.

In an avalanche of progress in the study of cells, the coming decade included the characterization of the minimal media requirements for cells and development of sterile cell culture techniques. It was also aided by the prior advances in electron microscopy, and later advances such as the development of transfection methods, the discovery of green fluorescent protein in jellyfish, and discovery of small interfering RNA (siRNA), among others.

The study of the structure and function of cells continues today, in a branch of biology known as cytology. Advances in equipment, including cytology microscopes and reagents, have allowed this field to progress, particularly in the clinical setting.

A Timeline

1595 – Jansen credited with 1st compound microscope
1655 – Hooke described 'cells' in cork.
1674 – Leeuwenhoek discovered protozoa. He saw bacteria some 9 years later.
1833 – Brown descibed the cell nucleus in cells of the orchid.
1838 – Schleiden and Schwann proposed cell theory.
1840 – Albrecht von Roelliker realized that sperm cells and egg cells are also cells.
1856 – N. Pringsheim observed how a sperm cell penetrated an egg cell.
1858 – Rudolf Virchow (physician, pathologist and anthropologist) expounds his famous conclusion: *omnis cellula e cellula*, that is cells develop only from existing cells [cells come from preexisting cells]
1857 – Kolliker described mitochondria.
1879 – Flemming described chromosome behavior during mitosis.
1883 – Germ cells are haploid, chromosome theory of heredity.
1898 – Golgi described the golgi apparatus.
1938 – Behrens used differential centrifugation to separate nuclei from cytoplasm.
1939 – Siemens produced the first commercial transmission electron microscope.
1952 – Gey and coworkers established a continuous human cell line.
1955 – Eagle systematically defined the nutritional needs of animal cells in culture.
1957 – Meselson, Stahl and Vinograd developed density gradient centrifugation in cesium chloride solutions for separating nucleic acids.
1965 – Ham introduced a defined serum-free medium. Cambridge Instruments produced the first commercial scanning electron microscope.
1976 – Sato and colleagues publish papers showing that different cell lines require different mixtures of hormones and growth factors in serum-free media.
1981 – Transgenic mice and fruit flies are produced. Mouse embryonic stem cell line established.
1995 – Tsien identifies mutant of GFP with enhanced spectral properties
1998 – Mice are cloned from somatic cells.
1999 – Hamilton and Baulcombe discover siRNA as part of post-transcriptional gene silencing (PTGS) in plants

READING COMPREHENSION TEST

Direction: Answer the following questions related to the story read.

When you are done, you may use pages 19-20 to check your answers

1. The cell theory was formally by whom?

a. Schleiden & Schwann
b. Mendel and Newton
c. Hooke and Leeuwenhoek
d. Jansen and Schwann

2. Who discovered cells?

a. Gregor Mendel
b. Charles Darwin
c. Robert Hooke
d. Anton Van Leeuwenhoek

3. The discovery of cells was published in what book?

a. Micrographia
b. Origin of Species
c. Origin of Continents and Ocean
d. Philosophiæ Naturalis Principia Mathematica

4. What does Rudolph Virchow's powerful dictum, "*Omnis cellula e cellula*" means?

a. Plant cells have cell wall.
b. Cell is the basic unit of life.
c. All organisms composed of one or mor cells.
d. All cells only arise from pre-existing cells

5. The first continuous cell line to be so cultured was derived from cervical cancer cells taken from whom?

a. Gregor Mendel
b. Marie Curie
c. Henrietta Lacks
d. Anton Van Leeuwenhoek

6. What specimen was used that lead to the discovery of cells?

a. Saliva.
b. Cork Wood.
c. Dental Scrapes.
d. Ground Soil.

7. Who discovered the first compound microscope?

a. Hooke
b. Einstein
c. Galileo
d. Jansen

8. What do you call the study of cells?

a. Mycology
b. Cytology
c. Geology
d. Meteorology

9. Siemens produced the first commercial transmission electron microscope in what year?

a. 1521.
b. 1665
c. 1995
d. 1939

10. Which among the following three conclusions about cells is incorrect?

a. The cell is the unit of structure, physiology, and organization in living things.
b. The cell retains a dual existence as a distinct entity and a building block in the construction of organisms.
c. Cells form by free-cell formation, similar to the formation of crystals (spontaneous generation).

ANSWER KEY FOR READING COMPREHENSION TEST

1. The cell theory was formally by whom?

a. Schleiden & Schwann - CORRECT
b. Mendel and Newton
c. Hooke and Leeuwenhoek
d. Jansen and Schwann

2. Who discovered cells?

a. Gregor Mendel
b. Charles Darwin
c. Robert Hooke- CORRECT
d. Anton Van Leeuwenhoek

3. The discovery of cells was published in what book?

a. Micrographia- CORRECT
b. Origin of Species
c. Origin of Continents and Ocean
d. Philosophiæ Naturalis Principia Mathematica

4. What does Rudolph Virchow's powerful dictum, "*Omnis cellula e cellula*" means?

a. Plant cells have cell wall.
b. Cell is the basic unit of life.
c. All organisms composed of one or mor cells.
d. All cells only arise from pre-existing cells- CORRECT

5. The first continuous cell line to be so cultured was derived from cervical cancer cells taken from whom?

a. Gregor Mendel
b. Marie Curie
c. Henrietta Lacks- CORRECT
d. Anton Van Leeuwenhoek

6. What specimen was used that lead to the discovery of cells?

a. Saliva.
b. Cork Wood- CORRECT
c. Dental Scrapes.
d. Ground Soil.

7. Who discovered the first compound microscope?

a. Hooke
b. Einstein
c. Galileo
d. Jansen- CORRECT

8. What do you call the study of cells?

a. Mycology
b. Cytology- CORRECT
c. Geology
d. Meteorology

9. Siemens produced the first commercial transmission electron microscope in what year?

a. 1521.
b. 1665
c. 1995
d. 1939- CORRECT

10. Which among the following three conclusions about cells is incorrect?

a. The cell is the unit of structure, physiology, and organization in living things.
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c. Cells form by free-cell formation, similar to the formation of crystals (spontaneous generation)- CORRECT

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A sophisticated reading assignment includes comprehending the key concepts and supporting elements of a textbook chapter, article, paragraph, sentence, or passage. Overall comprehension in college reading is dependent on the ability to draw conclusions, assess, and critically interpret articles or chapters. Topics and major ideas are present in all textbook chapters, articles, paragraphs, sentences, and passages. The "key concept" being represented is the main idea. Major and minor details support the main idea by describing how, what, when, where, why, how much, or how many things are done. Understanding the point(s) the writer is attempting to express is made easier by locating the topic, major idea, and supporting facts. Identifying the link between them will help you understand more.

Comprehension of written passages frequently necessitates the child's ability to perceive how various sections of the story are linked. Making and understanding connections between elements of a story and seeing the broader picture necessitates the child's comprehension of how all of the information are related to one another. Children will gain a better understanding of the text if they are taught to comprehend how the pieces of a tale are interrelated. Summarization is one example of such a strategy. Because not all pupils learn how to summarize a tale on their own, some youngsters must be taught how to do so precisely. Summarization is a good way for students to improve their comprehension of what they have read. Only the most relevant elements of a piece must be rewritten or outlined using this strategy. Summarization teaches students to look for the most significant portions of a tale and to evaluate which portions are less significant and should be skipped.

4. Conclusions and Future Scope

It was concluded that Filipino students lacks in comprehension, especially in Science. Since the preferred learning/reading materials of the students is online platform, the research states that it would be helpful to use online mode of remediation to enhance the reading comprehension skills of the students in Science. This can be a module that can be distributed online. In line with this, the research also concluded that aside from enhancing the reading skills of the students, teachers should also need to develop students' confidence in reading because it is evident that students tend to have higher scores if they are confident enough to read.

This study revealed the relatively poor reading comprehension skills of the senior high school students in core Science subjects. Thus, the following recommendation are hereby presented:

1. The students, teachers, or school administrators may use the module developed by the research. It consists of various phases such as identifying main ideas and supporting details, summarizing, and reading comprehension test that can be a helpful tool in addressing the issue of low reading comprehension level of the students in core science subjects.

2. Teachers may conduct a remedial reading session for their students who are having difficulties in reading comprehension. Teachers may choose reading materials that are visually appealing for all genders. Since according to Schwanenflugel (2018), girls outscore boys on early tests of general verbal ability; in same-age comparisons, they tend to have somewhat greater verbal fluency and more extensive vocabularies than boys during the preschool years, though these differences all but disappear as children grow older.

3. Teaching Science should be holistic. Aside from teaching the objectives of the subjects, instructors may include creative approaches to development different aspects of learning as well as the students' self-esteem. Senior high school subjects should be interactive, and instructors may continue to collaborate their subjects with other subjects.

4. Curriculum Developer may use the result of the study and the proposed module point out the areas in Science where students need to understand more. This may help the curriculum developer to have a basis for further enhancing the Science curriculum and make sure the reading comprehension should be incorporated even in the field of Science.

5. The future teacher-researchers that can test run the module that was developed in this study. They may use this as a basis for their research or to determine their students who can be subjected to undergo a remedial reading class.

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