

Carbon Dioxide Cycle

Oxygen - Carbon Dioxide Cycle

KHub

Subject/Grade Level: Grade 7/ 1st Year High School Integrated Science

Title: Oxygen-Carbon Dioxide Cycle

Competency: Students are able to explain the functions and importance of the different chemical cycles found in the ecosystem, and understand the state of the environment being affected due to harmful human activities.

KCh Learner Values: Cooperation (everyone doing their part in making sure society functions smoothly)

Critical Issues: Concern for the well-being and maintenance of nature

I. Objectives:

at the end of the session, the students should be able to

- understand and explain the functions and importance of the different chemical cycles (Carbon cycle, Oxygen cycle, Oxygen-Carbon Dioxide cycle, Water cycle, Photosynthesis, and Photolysis) to an ecosystem
- understand the impact that human activities (negative or positive) have in the different chemical cycles found in nature

II. Essential Understanding

Living things are interdependent on nature and the chemical cycles found in nature because of their function in producing gases needed by living things/the ecosystem.

Human activities have a significant impact on the environment and its processes

III. Essential Questions

There are many different chemical cycles happening in our ecosystems. Are these cycles interdependent on each other just as living things are dependent on each other?

The different living things in our environment are interdependent on each other for providing the necessary gases and nutrients that support life, which are being provided by the different chemical cycles found in our ecosystems. Are there any activities that can have effects (negative or positive) on our environment and our dependence on it?

IV. Summary of the Episode

The episode describes the path of energy, from the sunlight to the different compounds produced by cells that provide energy. Also described are the different interrelated chemical cycles occurring in nature and how these are important for the ecosystem.

The episode also discusses human activities and their impact on the environment and the chemical cycles

- Pollution in the environment affecting the chemical cycles and their output of chemicals
- Deforestation, which is a major cause of flooding, and increasing Global Warming and their effects on the chemical cycles

V. Pre-viewing/ Motivation

Before the film viewing, the teacher should introduce the topic for the day, and divide the class into pairs.

Ask the class to illustrate the water cycle and describe the different steps or processes involved based on what they already know, and include at least three questions about the cycles which will be included in the later discussion.

VI. Viewing Proper

Before the viewing proper, the teacher will introduce the video, explaining to the students what the video will discuss, what its title is, and where the video is from. The teacher will also instruct the students to take down notes on the important points of the video.

**Video: KHub (Grade 7/ 1st Year High School Integrated Science)
Oxygen - Carbon Dioxide Cycle**

VII. Post Viewing

Questions (re the episode)

1. What was the program about? Did you learn anything new?
2. Do you think the program discussed the topic well? Why, or why not?

Review questions (re content)

1. What is a chemical cycle? What were the different cycles discussed in the video?
2. What are the functions/significance of the different chemical cycles?
3. Cite other possible effects of the impact that human activities have on the chemical cycles.

Group Activity

1. The teacher will divide the class into four groups. For the first two groups, one will improvise a short skit about the process of Photosynthesis and its components, the other group will improvise a skit about the process of the Water Cycle. For the next two groups, one group will improvise a skit about the effects of Global Warming, and the other will improvise a skit about flooding due to pollution and logging.

VIII. Synthesis and Valuing

Discussion about the state of the environment, the worsening of Global Warming, and the effects it will have on communities now and in future years:

- cite additional examples (can be from the news) about problems in our environment due to Global Warming and due to pollution caused by humans
- possible situations in the future if ever Global Warming and pollution will continue and increase
- Given that the worsening state of the environment can have negative effects on humans, what actions are the different sectors of society (e.g. industrial, media, education, government), in cooperation with other sectors, currently doing in maintaining our environment? Can the students think of other possible actions?

IX. Homework

Ask the students to make a summary of their learnings and make a short reflection paper based on these.

Cell Parts and Functions

Cell Parts and Functions

Subject/Grade Level:	<i>High School Biology Class</i>
Title:	<i>Cell Parts and Functions</i>
Competency:	<i>Name the different parts of a cell and its function.</i>
KCh Learner Values:	<i>Importance of Teamwork</i> <i>Instilling in students the importance of health and wellness.</i>

I. Objectives

At the end of the session, students should be able to:

- Name the parts of the the cell.
- Cite the function/s of each cell part.
- Draw the entire cell and its organelles.
- Recite the Modern Cell Theory.
- Trace the history and scientists of cell discovery.

II. Essential Understanding

- The cell is the basic unit of all living things.
- There are lots of scientists and theories laid in history before we came up with the current modern cell theory.
- The cell contain the deoxyribonucleiuc acid which serves as the hereditary blue print of all living things.

III. Essential Questions

- What are the important roles of cells in the body and that of other living things?
- Who are the great minds behind the discovery of cell and its parts and functions?

IV. Summary of the Episode

The episode on “Cell Parts and Functions” traces the discovery of the cell for about 200 years ago. Renowned scientists in the discovery of cells and the postulation of the modern cell theory are featured in this video. The different parts of the cell were presented in various visual formats. The function of each part is mentioned and some important processes within the cell were named to point out the importance of the tiny bit of life.

V. Pre Viewing (Motivation)

The teacher will write the different parts of the cell on the board or in a manila paper and the students will have to identify the actual figure of those while watching the video. The students will also be asked to identify the functions of each cell part.

VI. Viewing Proper

The students will be asked to write down notes about the information they are getting from the video.

VII. Post Viewing

The actual activity will be done at this time. The class will be divided into 3 groups: (1) cell part cut-out, (2) cell part name and (3) the part’s function. The students will be asked to pair the cut-outs (cell organelles) to the names and functions.

VIII. Synthesis and Valuing

Our body is composed of various macro parts and the entire system won’t work harmoniously if a single part is ailing or dysfunctional. This relationship can be traced down up to the cellular level. There’s a lot of secrets and mystery that is hidden in the smallest compartments of a cell. Even the blue print of all living things are located in the cell. If a problem occurs at the cellular level, there will definitely be a domino effect to the bigger parts and systems of the body.

The body parts should always have good teamwork so it would perform its specific task. Same goes with group of people such that if people lose coordination and camaraderie, there will be no unity.

IX. Homework

The teacher will ask the students to check for more cellular processes by reading books, surfing the internet or interviewing an expert (i.e. doctor, teacher, etc.) and then will ask the students to present their findings in the next meeting. The students should present their report creatively like in a form of a role play or by using materials.

Human Reproduction

Human Reproduction Integrated Lesson Plan

(Based on K HUB's Episode: Human Reproduction)

Lesson Plan Overview:

Subject: Science

Title: Human Reproduction

Competency: Parts of the Male/Female Reproductive System & Human Reproduction

Critical Issue: Awareness and Responsibility through Sex Education

KCH Values: Responsibility for Procreation, Awareness in Social Issues (Overpopulation, PMS, Abortion)

Duration: 1 hour

I. Objectives

By the end of the lesson, the student shall be able to:

- Able to know and define the parts of the male and female reproductive system
- Familiarize themselves with human reproduction through the chronological process of life formation
- Be informed about their responsibility for procreation and not take life for granted

II. Essential Understanding

- When a woman is pregnant, that means a baby will soon be born.
- A baby is born when a man marries a woman

III. Essential Questions

- How does life begin?
- How can we show that life is valuable?

IV. Summary of the Episode

This episode of KHUB talks about human reproduction. This includes parts of the male and female reproductive system, sperm and egg formation, and the process of life formation.

V. Pre-viewing (10 mins.)

CLASS ACTIVITY:

The teacher presents several pictures related to the lesson. Present the first two (2) images listed above.

- Picture of a baby
- Picture of a pregnant woman

Class, I have here four pictures. What can you say about it??

Let's start with the first picture (baby, pregnant woman)

After the teacher presents the first two images, present the next two images. These images are as follows:

- Picture of the male reproductive system
- Picture of the female reproductive system

How about these two images. What can you say about it? What do you think these are?

Solicit at least three (3) to five (5) answers from the class before proceeding to the next lesson.

Now, let's find out what these images are in today's lesson.

VI. Viewing (15 mins)

- In this section, the video from Knowledge Channel will be shown.

Okay, class, make sure to take down important notes, especially regarding spermatogenesis and pregnancy. You will be using those notes in an activity later on.

VII. Post-viewing (10 mins)

- In order for to clarify if the student has understood the multimedia presentation, ask the students the following questions:
 - a. What is the video all about?

NOTE: In this question, you can gather more than five answers from the students. (ex. Reproduction, sperm production, spermatogenesis, oogenesis, fertilization, etc.)

- *Let us go back to the paper I gave you awhile ago.*
Together with the students, go back to the handout and ask them what the following parts are. Start with the top picture first and explain each part.

Now, let us fill in the blanks with the correct answer.

The **epididymis** is responsible for the production of sperm cells. They sperm is mixed with a fluid called **semen** which is produced by three glands which is the **seminal vesicles**, **bulbourethral glands** and the **prostate glands**. The sperm cells passes through the **urethra** which is also the passage for urine and through an external organ called the **penis**. These organs are part of the **male** reproductive system and the sperm now travels in the **female** reproductive system. The **ovary/ovaries** releases an **egg cell** to be fertilized by the sperm. As the sperm cells travel, the egg cell and the sperm cell meet at the **oviducts/fallopian tube**. As the sperm and egg meet, only one sperm cell penetrates the egg and fertilizes it. After a few weeks the fertilized egg goes down the **uterus** where the fetus grows until the baby is born. This process is called **Fertilization**.

What is the function of the male repro. System? (**Sperm Production**)

How is sperm produced? (**Through spermatogenesis**)

What is the cycle that happens every 28 days in females which changes the structure of their reproductive system? (**Menstrual Cycle**)

GROUP ACTIVITY (10 mins. working time.)

Divide the students into groups consisting of three (3) members. The goal is to arrange the process of pregnancy and spermatogenesis in chronological order.

The list for each category is as follows:

Spermatogenesis

1. Spermatogonia undergoes mitosis
2. Primary Spermatocytes undergo further process called meiosis I
3. Daughter cells are formed (secondary spermatocytes)
4. Secondary Spermatocytes undergo meiosis II, produces spermatids
5. Spermatids become flagellated sperm

Pregnancy

1. Ejaculation, sperm travels to the oviduct
2. Sperm surrounds oocyte, one sperm penetrates it
3. Fertilization occurs, goes down to the uterus
4. Embryonic stage and fetal stage occurs
5. After 9 months labor occurs and the uterus contracts
6. Embryonic fluid is disposed from the mother's uterus
7. The baby is ejected from the uterus through the vagina
8. The umbilical cord is cut and baby starts to breathe on its own

- Let them present their work after class. The teacher should check the correct order of each step.

VIII. Synthesis

Class, now that we have learned something about the reproductive system, you should not engage in sexual intercourse at your age right now. Why do you think so?

- Solicit answers from the class.

QUIZ (10 mins.)

Let them answer a quiz that reviews the topic of the day. Give them 10 minutes to answer and collect them before the class ends.

TRUE 1. Fertilization takes place when the egg cell and sperm cell meet.

FALSE 2. The seminal vesicles, bulbourethral glands and the epididymis is responsible for producing semen.

TRUE 3. The urethra serves as the passage for both urine and semen.

FALSE 4. The fertilized egg cell, goes to the vagina until it becomes a fetus.

FALSE 5. Labor occurs after 8 months of being in the uterus.

- [1] **Spermatogonia** undergoes mitosis
- [4] Secondary Spermatocytes undergo meiosis II, produces **spermatids**
- [5] Spermatids become flagellated **sperm**.
- [2] Primary Spermatocytes undergo further process called **meiosis I**
- [3] Daughter cells called **secondary spermatocytes** are formed

IX. Homework

- Create an album showcasing their growth (infancy, toddler, child, teenage).
 - Provide pictures and a description for each of the following stages:
 - a. infant
 - b. toddler
 - c. child
 - d. teenage (what you look like today)
- They can use colored papers. Be creative.

MATERIALS USED IN THIS LP:

1. Manipulatives
2. Colored papers containing the words for the 1st activity
3. Answer sheets (illustration with the paragraph, seatwork, group work)
4. Markers, for checking
5. Computer and projector for the video

REFERENCES:

Dakanay, Dexter (2011). *KHUB: Human Reproduction*. Available from <http://www.youtube.com/watch?v=ktq-YwDRpUg>.

KHUB Digestive and Endocrine System

KHUB Digestive and Endocrine System

Subject/Grade Level: Science/Grade 7

Title: Digestive and Endocrine System

Competency: Digestive and Endocrine System

KCh Learner Values: Taking good care of the body. Learners will understand the importance of

proper eating habits and choosing the right food to eat as it affects bodily performance and brain functions.

Critical Issue: Choosing the right food to eat and eating a balanced diet is essential for bodily processes.

I. Objectives: At the end of the lesson, the students should be able to:

- Name the essential parts the digestive and endocrine system, and explain the functions of each organ
- Explain how the the processes of breaking down of food and absorption of nutrients occur
- State the interconnectedness of digestive and endocrine system and how they are dependent to each other.
- Choose a balanced diet for the body

II. Essential Understanding

What we digest in our bodies as food is processed by the organs inside our body and result of

this process becomes part of the nutrients and energy our body use for our day to day activities

III. Essential Question

- How do we choose the food we eat that will help our bodies convert into useful energy?
- What organs help in the digestion of food?
- What processes does this food undergo to be converted to necessary nutrients and energy?
- What factors affect our eating habits and cravings for food?

IV. Summary of the Episode

The episode describes how the digestive system processes the food we eat and what processes do the food undergo in order to be beneficial to the body. It also highlight the factors affecting the eating habits as dictated by the endocrine system.

V. Pre-Viewing(Motivation)

Students will be divided into two teams and will debate on the proposition” You are what you eat”! Each team will be assigned to defend a side whether affirmative or negative. Each group will be given the chance to speak for or against the saying.

VI. Viewing Proper

KHUB Episode on Digestive and Endocrine System.

Viewing Time: 18 minutes and 39 seconds

Students will learn from Professor Ma.Rosario Wood and students of Philippine Science High School as they explore the digestive and endocrine system. It discusses the vital organs necessary for digestion as well as how endocrine system affects eating behavior of people. Students needs to take down notes about the essential parts of the system and its functions

VII. Post Viewing

1. Questions (re the episode)
 - a. Do you like the episode? Why or why not?
 - b. What was the episode all about?
2. Review Questions(re content)
 - a. What are the two main functions of digestion?

- b. What are the two stages of digestion that occur in the body? How do they differ from each other?
- c. How do the supporting organs assist in digestion?
- d. Where does the final digestion and absorption take place?
- e. What factors affect our digestion?
- f. What are the glands responsible for the secretion of hormones?
- g. How are the hormones connected with the digestion process?

3. Group Activity

Students will work on a puzzle of the digestive and endocrine system. Pictures will be cut out for

this purpose. They have to solve the puzzle by placing the organs in its proper place and be able to name that organ through labeling and tell its function in the digestion process. Same type of task will be done to the endocrine system. Students will post their work inside the science room.

VIII. Synthesis and Valuing

Learners now demonstrate mastery of the digestive and endocrine system and the process that occur within. Therefore, learners **will understand the importance of eating the right food** so that proper nutrients will be processed by the body and not the harmful toxins and chemicals in today's fast food culture. The **learner will also realize the importance of taking care the organs within the body** as they are essential to bodily functions and processes we are unaware of.

IX. Assignment

Ask an expert, parent, elder, dietician or nutritionist near a local health center about a recommended diet for your age. Be able to present this in class through an interactive presentation, (i.e portfolio, video, powerpoint presentation etc). Highlight the needed minerals and nutrients in the diet and its importance to our body.

Kingdom of Animals

Subject/Grade Level: Biology

Title: Kingdom of Animals

Competency: Different groups of animals, its body structures and adaptive features of vertebrates and invertebrates

KCh Learner Values: Interdependency of organisms
I am interdependent

Critical Issue: Each organism depends on other organisms and presence of invertebrates in body of water determines the pollution level of water

I. Objectives

1. Identify the different group of animals

2. Describe the body structures of animals
3. Describe the adaptive features of representative invertebrates and vertebrates

II. Essential Understanding

Invertebrates constitute 27 different phyla in the animal kingdom.

Vertebrates constitute only part of a single phylum: The Phylum Chordata. Invertebrates were the first animals to evolve on earth. Scientists believed that the first invertebrates originated from colonies of protozoa.

Invertebrate Animals Phylum

- (A) Phylum Porifera
- (B) Phylum Cnidaria
- (C) Phylum Platyhelminthes
- (D) Phylum Nematoda
- (E) Phylum Annelida
- (F) Phylum Mollusca
- (G) Phylum Arthropoda
- (H) Phylum Echinodermata

Porifera- were long thought to have diverged from other animals early. They lack the complex organization found in most other phyla. Their cells are differentiated, but in most cases not organized into distinct tissues.

Cnidaria- are radially symmetric and have digestive chambers with a single opening, which serves as both the mouth and the anus.

Echinodermata - are radially symmetric and exclusively marine, including starfish (Asterozoa), sea urchins, (Echinozoa), brittle stars (Ophiurozoa), sea cucumbers (Holothurozoa) and feather stars (Crinozoa).

Arthropoda - is the largest animal phylum including insects, spiders, crabs, and their kin. All these organisms have a body divided into repeating segments, typically with paired appendages. In addition, they possess a hardened exoskeleton that is periodically shed during growth.

Nematoda- or roundworms, are perhaps the second largest animal phylum, and are also invertebrates. Roundworms are typically microscopic, and occur in nearly every environment where there is water.

Mollusca and Annelida - the former, which is the second-largest animal phylum by number of described species, includes animals such as snails, clams and squids, and the latter comprises the segmented worms, such as earthworms and leeches.

III. Essential Question

1. What is the difference between vertebrates and invertebrates?
2. What are the 8 phyla under invertebrates?
3. Give examples of animals under each phylum.
4. What are the body structures of animals and its functions?
5. Why do we need to protect the animals especially the invertebrates?

IV. Summary of the Episode

Students will summarize the content of the video by asking them to define the different phyla and give examples of representative animals. Ask them also to enumerate the uses or functions of these animals in the ecosystem.

V. Pre-viewing (Motivation)

- Show students a video of Pasig River or Marikina River. Then ask them if there are still living organisms living in that body of water.
- Discuss the given assignment on some words with definitions to unlock the difficulty of the topic.
- Ask the students the difference of plants from animals
- Let students give some functions of animals in the ecosystem.

VI. Viewing Proper

Students will be asked to take down notes while viewing. If there is a need to pause the video, it will be done so the students can understand the video. The link of the video can be given to students for further viewing at home.

VII. Post Viewing

1. Questions about the episode
 - • Can you guess what body of water is this?
 - • Can you name animals you are familiar with?
 - • What characteristics do vertebrates and invertebrates share in common?
 - • Which group of animals first appeared on earth, vertebrates or invertebrates?
 - • How do sponges grow?
 - • How do sponges reproduce?
 - • What is the importance of sponges in the ecosystem?
 - • To what phylum do corals belong?
 - • What is coral bleaching?
 - • What are most distinguishing of a crab?
 - • What are the characteristics of arachnids?
 - • Can you cite some importance of mollusks?
 - • What are the other examples of echinoderms?
 - • Can you name some importance of these organisms?
 - • What is the role of invertebrate organisms in the ecosystem?
2. Review questions regarding the content
 - • Differentiate vertebrate from invertebrate.
 - • Give examples of animals under each phylum.
 - • What are the functions of these animals in the ecosystem?

3. **Group Activity**

- Students will be asked to draw the different phyla and give examples

VIII. Synthesis and Valuing

- Students will be asked to synthesize the topic by writing a generalization.
- At the end of the lesson, the students should realize how important each organism is in balancing the nature. Inculcate also among students the value of preserving the life of each organism by knowing the function of this organism in the environment. Also, since animals present in a body of water determines the condition of it, it will be important to teach students how to become responsible not to pollute bodies of water to preserve these organisms.

IX. Assignment

- Ask the students to watch a cartoon sponge bob and ask them to identify different groups of animals by phylum. Write the answers in 1 whole sheet of paper.

References:

Retrieved from <http://www.yale.edu/ynhti/curriculum/units/1995/5/95.05.08.x.html#c>

Retrieved from

http://www.kchonline.ph/index.php?option=com_allvideoshare&view=video&slg=kingdom-of-animals&orderby=latest

Retrieved from <http://en.wikipedia.org/wiki/Invertebrate>

Leaves

Plant Organs - Leaves

KHub

Subject/Grade Level: Grade 7/ 1st Year High School Integrated Science

Title: Plant Organs - Leaves

Competencies: Students are able to identify the parts of the leaf, including their structure and functions, as well as identify and classify the different kinds of leaves. Students are also able to describe the process of photosynthesis as well as its importance.

KCh Learner Values: Appreciating Diversity

Critical Issues: Understanding the important function of leaves, or plants in general, in maintaining a healthy environment.

I. Objectives

at the end of the session, the students should be able to:

- identify the parts of the leaf, along with their internal structure, and their functions

- identify and classify the different kinds of leaves according to their number of leaves attached to the petiole, leaf arrangement, leaf venation, and shape of the leaf margin.

- describe the steps in the process of photosynthesis

II. Essential Understandings

The leaves of a plant play a very important role in keeping the plant alive, and in maintaining the environment and the lives of its inhabitants.

III. Essential Questions

Is it important that we are able to classify leaves, considering that we have a many different kinds of plants in our country?

Are the lives of the living things found everywhere dependent on leaves?

IV. Summary of the Episode

The episode discusses the parts of a leaf and their functions, including the process of photosynthesis, and the classification of leaves according to their number of leaves attached to the petiole, leaf arrangement, leaf venation, and shape of the leaf margin. Also included in the episode is the role of the leaf in lessening the harmful effects of greenhouse gases

V. Pre-viewing/Motivation

Before the film viewing, the teacher will introduce the topic.

The teacher will have a discussion with the class about the parts of a leaf, and will ask the class to enumerate the parts (to be written on the blackboard) and their functions based on what the class currently knows.

VI. Viewing Proper

Before the viewing proper, the teacher will introduce the video, explaining to the students what the video will discuss, what its title is, and where the video is from. The teacher will also instruct the students to take down notes on the important points of the video.

**Video: KHub (Grade 7/ 1st Year High School Integrated Science)
Plant Organs - Leaves**

VII. Post-viewing

Questions (re the episode)

1. What was the program about? Did you learn anything new?
2. Do you think the program discussed the topic well? Why, or why not?

Review questions (re content)

1. What are the parts of a leaf and their functions?
2. What are the different classifications or types of leaves?
3. What are the steps in the process of photosynthesis?
4. What role do leaves have in maintaining our environment?
5. How are Greenhouse Gases harmful? How do leaves help in lessening their effects?

Group Activity

1. The teacher will group the class into five groups. The groups will then form lines, and have one representative at the front. The teacher will give a group activity by using a projector and slides of images of the different parts and the different classifications of leaves, where the students have to give the name of what is on the slide or image. It will be done like a competition; whoever answers first gets the point. Every member should be able to go to the front and answer a question at least once.

VIII. Synthesis and Valuing

Discussion about the plant organs and their functions, as well as the importance of photosynthesis.

- Seeing as how photosynthesis serves a very important function in supporting life, can you describe the situation if ever photosynthesis stops or disappears?

- Knowing that photosynthesis, which is done in leaves, (which are found on plants,) is vital to life, do you think it is possible that humans can stop the activities that destroy large numbers of plants? Also taking into account that even activities such as logging serve some purpose in society.

Discussion about the benefits of diversity in our environment and diversity in our society.

- Why do you think there are different types of leaves? Do you think the different types of leaves serve any important function to the plant? If yes, what?

- The Philippines is home to so many diverse cultures and peoples. Does this amount of diversity benefit our society?

- Is it also important that we preserve the culture and identity of these people? Why, or why not?

IX. Homework

Ask the students to do additional research on Greenhouse Gases and Global Warming and write an essay on the important points they learned in their research, and their opinion on the matter. to be submitted to the teacher.

Mitosis and Cell Cycle

Subject/ Grade Level:	1 st Year Integrated Science
Title:	Cell Division Part 1: Mitosis and Cell Cycle
Competency:	Cell Division: Mitosis
KCh Learner Values:	Care for the Body
Critical Issues:	Care for the Body

I. Objectives

At the end of the session, students should be able to:

1. Describe how cells reproduce themselves
 2. Describe in sequence the events in mitosis
 3. Compare the changes that occur during the stages of cell's development
- II. Essential Understanding
- Cell division replaces worn out or damaged cells
 - Cell cycle consists of: preparatory phase or interphase, cell division or mitosis and cytokinesis or division of cytoplasm
 - Stages of Mitosis: prophase, metaphase, anaphase, telophase
- III. Essential Questions
- How does a human being grow from a single fertilized cell into an individual containing billions of cells?
 - How is the genetic blueprint that makes you who you are transmitted faithfully from one cell to the next?
- IV. Summary of the Episode
- This episode focuses on the process of cell division. It involves reproduction, growth and repair cells. It discusses the stages of mitosis.
- V. Pre Viewing (Motivation)
1. Make a hotcake: Holding up the ingredients, open a discussion about not having enough batter to feed everyone in class.
 2. Ask how will we double the recipe?
 3. Suggest ways like: adding water will double the amount of batter
 4. Let your students ponder and suggest ways until they come up with the conclusion that you have to double everything to double the recipe of the hotcake.
 5. Ask the students, if a cell is going to divide, creating two "daughter" cells that are identical, what must first happen in the "parent" cell?
 6. Tell the students that in the video that are about to see the concept of cell division and the stages it undergo. Take note of how the cells reproduce, and repair itself.
- VI. Viewing Proper
- K-Hub (Grade 7 – Integrated Science)
- Cell Division: Mitosis Part 1
- VII. Post Viewing
1. Questions (re the episode)
 - a. Did you like the program? Why or why not?
 - b. What was the program about?
 2. Review Questions (re content)
 - a. According to the video, what is cell division?
 - b. What are the phases or stages the cell undergoes?
 - c. How does the cell divide?
 - d. What are the functions of each stages?
 3. Deepening
 - a. What is the importance of mitosis?
 - b. When you get an open wound or sick, how do you get better?
 - c. When you get sick because of smoke, do cells replicate and repair? Compare the division of cells of a smoker and a non-smoker.
- VIII. Synthesis and Valuing
- To end the session, ask the following:
- a. What are ways to keep our body fit and healthy?

- b. As we grow old, the divisions of cells weaken what should we do now to keep our body fit and healthy until we get old? What are the things we should do and not do?
- IX. Homework
Using different kind of seeds or noodles, model the stages of mitosis and label them.

Muscular and Skeletal Systems

Muscular and Skeletal Systems

K Hub (Muscular and Skeletal Systems Episode)

Subject/Grade Level:	Grade 7 Integrated Science
Title:	Muscular and Skeletal Systems
Competency:	Muscular and Skeletal Systems
KCh Learner Values:	Driven & Creativity
Critical Issues	Knowing and taking care of our body

I. Objectives

At the end of the session, students are expected to:

- To learn the different structures and functions of the bone, and bone formation during development.
- To learn muscle contraction and the types of muscles in terms of structure and location.

II. Essential Understanding

- Our human body is composed of different organ systems.
- Some of these organ systems are the Skeletal and the Muscular systems.
- Bones and muscles constituted most of our body mass.
- It is very vital to know how important these two organ systems.

III. Essential Questions

- Where does our body gets its shape?
- How does our body make movements?

IV. Summary of the Episode

Three Grade 7 students consult their Biology teacher about the slight injury of the one of them. This episode discusses the function of the human body's Skeletal and Muscular Systems. It also tackles the major parts of each system.

V. Pre Viewing (Motivation)

Group the class into pairs. Each pair will be given or tasked to bring beforehand their own used newspapers, popsicle sticks and sticky tape. In 10 minutes, each pair should make a human figure out of the said materials. The twist in the activity is that only one person can use his/her right hand while the other one, only his/her left hand. The most creative work will be given a prize.

VI. Viewing Proper

The students will watch an episode of K Hub, the "Muscular and Skeletal systems" Episode.

VII. Post Viewing

1. Questions (re the episode)

- a. Did you like the program? Why or why not?
- b. What was the program about?

2. Review Questions (re content)

- a. What are the parts and functions of the human Skeletal System?
- b. What are the parts and functions of the human Muscular System?
- c. How can we take care our Skeletal and Muscular System?

3. Group Activity

Group the class into groups of five. Each member of the group will share their favorite sports game to each other. The group will choose the best game to present in front of the class and discuss how the chosen game can benefit their skeletal and muscular systems.

VIII. Synthesis and Valuing

Describe your Physical Education class. Why do you think the school offers such kind of program?

Children and teens should not only be intellectual, but at the same time healthy and strong. Through different sports activities, our body will be stronger.

IX. Homework

Research on the common diseases (prevention, symptoms, treatment) that occurs in the Skeletal and Muscular system.

Photosynthesis and Respiration

Photosynthesis / Respiration

KHU
B

Subject/Grade Level:

1st year Integrated Science

Title:

Photosynthesis and Cellular

Respiration

Competency:

Photosynthesis / Respiration

KCh Learner Value:

Fair-minded

*Understanding individual differences to
prevent discrimination*

Reflective

*Looking at the beauty of things that is
found within*

Critical Issues:

Equality among organisms

despite differences

I. Objectives

At the end of the session, students should be able to:

- understand why leaves come in different colors

- understand how organisms produce energy
- differentiate aerobic from anaerobic respiration
- know the stages of cellular respiration

II. Essential Understanding

- The appearance of both plants and people may differ, but the true beauty of each can only be seen if we're able to understand what's within.
- The things humans do can affect the different processes in their body just like in plants.

III. Essential Questions

- What factors make plants and humans similar?
- How can the study of plants help us better understand ourselves?
- What is the importance of cellular respiration?

IV. Summary of Episode

The episode explains the process of oxidizing food molecules like glucose to carbon dioxide and water. The energy released is trapped in the form of ATP to be used by all the energy consuming activities of the cell.

V. Pre Viewing (Motivation)

Group the students and ask them to gather different leaves they see around campus. Tell them to make sure they know what plant these leaves are from. After some time, let them go back to the classroom and discuss what they think are the reasons why these leaves differ in color.

VI. Viewing Proper

- KHUB (HS Year 1 – Integrated Science) ---Photosynthesis
- Important reminders while watching the video:
 - Be sure to have a pen and paper ready. Take down essential information while watching the video.

- Pay careful attention to the details you'll encounter while watching the video.

VII. Post Viewing

1. Questions

- a. Did you find the program interesting? Why or why not?
- b. What was the program about?

2. Review Questions

- a. Why do leaves come in different color? How do they attain these colors?
- b. State the different pigments plants may contain which were mentioned in the video. What specific color do these pigments correspond to?
- c. How can we separate and identify the pigments a leaf contains?
- d. What form of energy is produced during cellular respiration?
- e. Compare and contrast aerobic from anaerobic respiration. Create a table and state the different stages under each respiration and the molecules formed in each stage. Be sure to be able to briefly explain the purpose of each stage.
- g. What causes the Krebs cycle to stop? What does this result to?
- h. How many ATP's does aerobic respiration produce? How about anaerobic respiration?

3. Group Activity

Prior to the day the activity will be done, ask the children to group themselves and bring the materials that will be needed to perform paper chromatography.

After watching the video, allow the students to group together and guide them in performing their own paper chromatography. Use the leaves they were able to gather during the motivation activity.

VIII. Synthesis and Valuing

We must not immediately discriminate others based on their physical appearances. We must always strive to know them better and understand what they are going through in order to promote peace and harmony.

We must take good care of our bodies and practice healthy habits because even the simplest things we do affect our bodily processes.

IX. Homework

It has been mentioned in the video that plants have pigments which result in the differences in color. Likewise, humans have melanine which is responsible for the differences in complexion. In what other ways are plants similar and different to humans? Create a Venn Diagram to compare and contrast.

Photosynthesis

Photosynthesis

Subject/Grade Level:	1 st year Integrated Science
Title:	Photosynthesis
Competency:	Photosynthesis
KCh Learner Value:	Responsibility
	<i>Knowing the importance of plants in our planet and learning how to take care of them</i>
Critical Issues:	Humans' role in environmental sustainability

I. Objectives

At the end of the session, students should be able to:

- understand how the leaves of plants get their green color
- know and understand the process of photosynthesis and other processes involved in it
- identify the importance of photosynthesis to plants, animals, and humans
- know the role of humans in protecting plants and consequently the whole environment

II. Essential Understanding

- Plants have life too. They have their own needs in order to sustain their lives, and humans are responsible to take care of them and help them attain these needs.
- The existence of plants in our planet is important because they produce oxygen necessary for human survival, they purify the air that we breathe, and they are our source of food.

III. Essential Questions

- Why is the process of photosynthesis important?

- What organizations in the Philippines help protect and sustain plants and help in plant growth?

IV. Summary of Episode

The episode talks about photosynthesis as a process that converts carbon dioxide into organic compounds, especially sugars, using energy from the sun. It occurs in plants, algae, and many species of bacteria, but not in Archaea.

V. Pre Viewing (Motivation)

Before letting them watch the video, ask them to grab a pair. Let them list down 5 benefits they think they get from plants.

VI. Viewing Proper

- KHUB (HS Year 1 – Integrated Science) ---Photosynthesis
- Important reminders while watching the video:
 - Be sure to have a pen and paper ready. Take down essential information while watching the video.
 - Pay careful attention to the details you'll encounter while watching the video.

VII. Post Viewing

1. Questions
 - a. Did you find the program interesting? Why or why not?
 - b. What was the program about?
2. Review Questions
 - a. Why is the existence of plants important to us?
 - b. How do leaves get their green color?
 - c. What are the requirements for plant growth?
 - d. What is photosynthesis? What are the processes involved in it?

- e. Explain why water is needed for photosynthesis. What happens to the hydrogen? What happens to the oxygen?
- f. What is meant by CO₂ fixation? What enzyme is involved in this process?
- g. What time of day (light or dark) do the light reactions occur?
- h. What is the structural formula for glucose?

3. Group Activity

A song about photosynthesis will be taught to the students by their teacher. The lyrics will be written on a manila paper. The teacher can either present the song to the class using his/her own means, or present a video of the song. The class will then be divided into groups. Each group will be given time to discuss and prepare.

Afterwards, they have to present the song in a creative manner.

The lyrics go like this:

If you want to know / How a plant grows / It takes water,
air, and sunlight / And makes cellulose

Every plant can do this / Fundamental process / And we
can call this / Photosynthesis

Unlike me and you / Plants need CO₂ / And they make
oxygen / That stops us turning blue

Every plant can do this / Fundamental process / And we
can call this / Photosynthesis

It's a miracle / How all the chlorophyll / Captures sunlight
in the leaves / Of the plants and the trees

A plant of any size / Can do it if it tries / But we're not
green, so we can't / photosynthesize

Every plant can do this / Fundamental process / And we
can call this / Photosynthesis

It's a miracle / How all the chlorophyll / Captures sunlight
in the leaves / Of the plants and the trees

Every plant can do this / Fundamental process / And we
can call this / Photosynthesis

Every plant can do this / Fundamental process / And we
can call this / Pho-to-syn-the-sis

Photosynthesis

Link to the song video:

<http://readingtonscience.wikispaces.com/Photosynthesis+-+Song+%26+Lyrics>

VIII. Synthesis and Valuing

As mentioned in the video, plants are important to us because they produce the oxygen that we breathe. They also purify the air, and they are our source of food.

Human activities continue to deplete our finite resources. If we continue to use resources without replacing them, we will soon feel the effects of having insufficient plants around us, and maybe even destroy the planet we live in.

Here are several actions that can be done by people to protect plants:

1. Reforestation - pertains to planting new trees to replace those that have been cut
2. Use of chemicals that aren't harmful to plants
3. Creating wildlife parks to preserve plants

As students, what other activities can you do to protect plants?

IX. Homework

Make a poster about the process of photosynthesis. Be as creative as

you can. You may use any medium that you are most comfortable with (i.e. digital poster, hand made, etc...)

Plant Tissues

Subject/ Grade Level: Science Grade 7

Title: Plant Tissues

Learning Competency: Identifies and describes plant tissues.

KCH Learner Value: Appreciation

Critical Issue/Value Focus: Human awareness and appreciation of the uses of the smallest things in plants.

I. Objectives

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

- Identify and compare the different plant tissues
- Describe the functions of different plant tissues and their importance to plant growth

II. Essential Understanding

- Plant tissues are responsible for the growth of the plants.
- Even the smallest things that we cannot see have beneficial functions.
- There is a life form in the tiniest organism.

III. Essential Questions

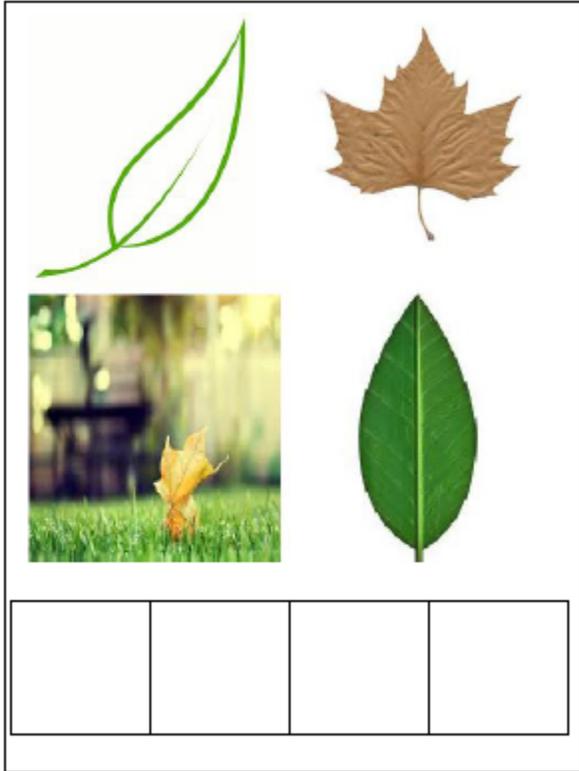
- Why are small things, such as the plant tissues, important?
- How can we show our appreciation to the smallest organism?

IV. Summary of the Episode

This episode focused on the a biologist and three students discussing the different plant tissues. It shows and explains the different functions of each tissue. It also discusses the role of each tissue to the growth of a plant.

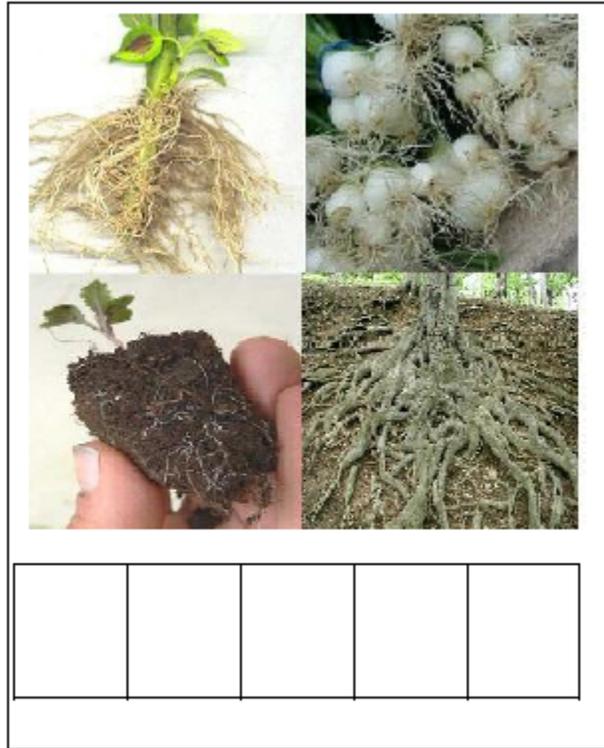
V. Previewing (Motivation)

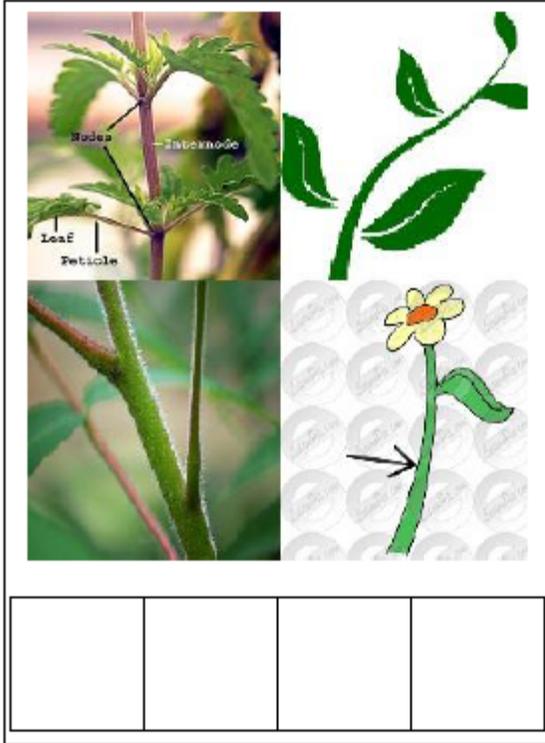
Do a 4-Pics-1-Word Game. Show the pictures to the students and let them guess the word that describes all four pictures.



(leaf)

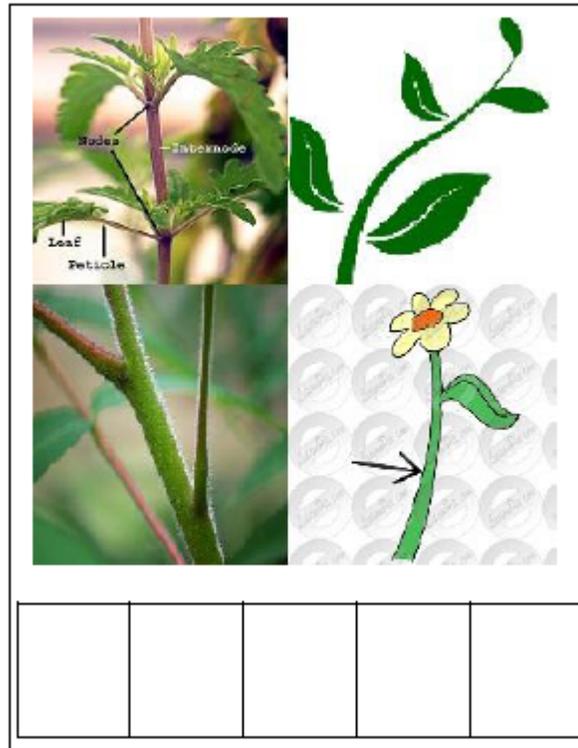
(roots)



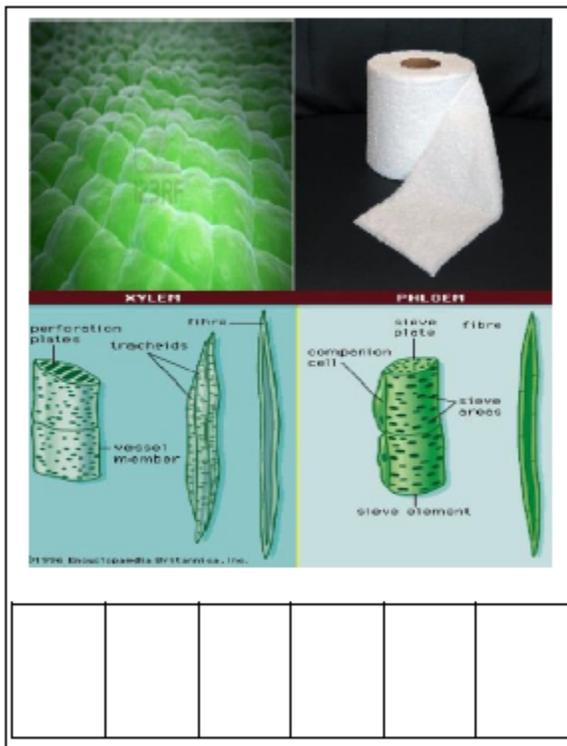


(stem)

Show these last two sets of pictures to introduce the concept/topic to



be discussed.



(plant)

(tissue)

VI. Viewing Proper

- **Plant Tissues** (7th Grade)
- The different types of plant tissues will be highlighted in the episode. Write down notes about the specific functions of each type of tissue, where they can be found in the plant, and how they help in the growth of the plant.

VII. Post Viewing

1. Questions (re episode)

- a. What was the program about?
- b. Which part of the program did you like? Why?

2. Review Questions (re the content)

- a. What are plants made up of?
- b. What are conducting tissues? What are the two types of conducting tissues of a vascular plant? Describe each type and identify their specific functions.
- c. What are shoot system and root system? Differentiate the two system.
- d. What are meristematic tissues? What are its two types and their functions?

3. Group Activity

Guessing Game

1. Group the class into 4.
2. Each group should have a representative.
3. The representative will pick a random paper with a name of plant tissue written on it but the representative will not read it.
4. The teacher shows the paper to the group members.
5. The group members need to say words that are related to/describes the plant tissue they pick.
6. The representative will guess the plant tissue.
7. Each group will be given one minute to guess as many words as they can.

This is the list of tissues that should be written on each paper by the teacher:

- meristematic tissues
- dermal tissues
- ground tissues
- vascular tissues
- parenchyma tissues
- collenchyma tissues
- sclerenchyma tissues
- xylem tissues
- phloem tissues
- epidermal tissues
- periderm

VIII. Synthesis and Valuing

Sometimes even the smallest things that we usually ignore have their useful functions. As the program said, it is from little things that bigger things grow.

Our life started from the smallest structure in our body called cells. Cells group themselves to make tissues. Each tissue has its own specific function and we need all these types of tissues to function well.

For example, in our family, youngest children or babies seemed to be just small kids. But for us, they have greater impact and importance in our lives. They complete our family. They are usually our source of entertainment and happiness. Aside from that, they usually possess the sweetness and cuteness which we can't resist. They are part of our lives.

No matter what the size of a thing, structure, or organism is, we must appreciate their value.

IX. Assignment

Group the students into five-seven (depending on the class size) and ask them to make a poster/collage about plant

tissues. Label the different plant tissues and on a separate sheet, write the function/s of these tissues.

Respiratory and Excretory System

Respiratory and Excretory Systems

K Hub (Respiratory and Excretory Systems Episode)

Subject/Grade Level:	Grade 7 Integrated Science
Title:	Respiratory and Excretory Systems
Competency:	Respiratory and Excretory Systems
KCh Learner Values:	Community-oriented
Critical Issues	Taking care of our body and environment

I. Objectives

At the end of the session, students are expected to:

- To understand the structure of the respiratory system as well as the mechanism and control of breathing.
- To know the structures of the Urinary System and Kidney Function.

II. Essential Understanding

- Our human body is composed of different organ systems.
- Some of these organ systems are the Respiratory and Excretory systems.
- Both organ systems are responsible for the excretion of different waste material in our body.
- It is very vital to know how important these two organ systems.

III. Essential Questions

- How do we breathe?
- What organs control our breathing?
- What organs comprise the Respiratory System?
- What are the functions of each organ in the Respiratory System?

- How do we eliminate the wastes in our body?
- What organs comprise the Excretory System?
- What are the functions of each organ in Excretory System?

IV. Summary of the Episode

Luis, Samantha and Vincent are Grade 7 students. While walking together, Luis was slightly choked because he was laughing and eating at the same time. Their Biology teacher saw what happened and gave him water. The teacher explained what happened and discussed Respiratory and Excretory systems.

V. Pre Viewing (Motivation)

Group the class into five. Each of the group will draw their dream house in an illustration board.

Then, they will add drawings on their dream house if such cases happen:

1. A lot of cars go and on by the street.
2. A factory emits too much smoke.
3. There are plenty of smokers nearby.
4. Neighbors are throwing garbages everywhere.
5. The canals are clogged.
6. A storm came in.

The class will be asked:

1. What can you say about your dream house before such cases happen?
After?
2. What are the bad effects of such pollution?
3. Is our health secured? Why? Why not?
4. What can we do about it?

VI. Viewing Proper

Students will be tasked to take down notes while watching the video of K Hub “Respiratory and Excretory systems”

VII. Post Viewing

1. Questions (re the episode)
 - a. Did you like the program? Why or why not?
 - b. What was the program about?

2. Review Questions (re content)

- a. What are the parts and functions of the human Respiratory System?
- b. What are the parts and functions of the human Excretory System?
- c. How can we take care of our Respiratory and Excretory System?

3. Group Activity

The class, divided into five groups, would have to show the class the benefits in protecting our respiratory and excretory system; and how they can be achieved. The first group will make a poster, the second group will show newscasting, the third will make a skit, the fourth will make a song, the fifth will make a poem.

VIII. Synthesis and Valuing

“Keep Your Environment Clean” reads a poster in front of the school building. Another one reads “No Smoking” along the hallway. What do the posters tell everyone? We should keep our environment clean so that air we inhale will be clean also. If we took care of our environment, we also took care of our body. We should also participate on the community projects which are related in keeping our environment clean and also in keeping our body fit.

IX. Homework

Research on the common diseases (prevention, symptoms, treatment) that occurs in the Respiratory and Excretory system.

Roots and Stems

Subject/ Grade Level: Science Grade 7

Title: Roots and Stems

Learning Competency: Identifies and describes the different types of roots and stems.

KCH Learner Value: Adaptability

Critical Issue/Value Focus: Ability of human to adapt and adjust to different situations or environment.

I. Objectives

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

- Identify the functions of roots and stems
- Describe the internal structure of roots and stems
- Give examples of common types of modified roots and stems

II. Essential Understanding

- Roots and stems are essential to plant growth and reproduction.
- Modified roots and stems give the plant an advantage in living in certain types of environments.
- Plant roots and stems are also essential to the everyday life of humans.

III. Essential Questions

- What functions of roots and stems are essential for the plant's growth?
- Why are modified roots and stems important to the plant?

IV. Summary of the Episode

The episode shows a biologist discussing roots and stems with children. As they give their insights and ideas about these plant parts, the biologist corrects their statements and adds more information. They also talk about modified roots and stems, more specifically the types that are eaten or used by humans.

V. Previewing (Motivation)

The class will be asked to think of examples of vegetables and fruits that they know. They will be asked to categorize the examples that they gave into: leaf, flower, root, and stem on the blackboard. Each student will get a chance to write his/her own answer.

Once the activity is done, the teacher can now introduce the topic. The teacher could say that fruits and vegetables don't only come from the leaves and flowers of plants. Roots and stem are also edible parts of plants. Aside from the common functions of roots and plants, they also have modified functions that serve different purpose, not only for the plant itself, but also for the human as well.

VI. Viewing Proper

- **Roots and Stems** (7th Grade)
- The parts of the roots and stems will be highlighted in the episode. The students should take note of the different kinds of modified roots and stems and their functions. The students should also validate and correct the list that they did earlier.

VII. Post Viewing

1. Questions (re episode)

- a. What was the program about?
- b. Which part of the program did you like? Why?

2. Review Questions (re the content)

- a. Describe the roots and stem of a plant. what are their main characteristics?
 - b. Where can we find the roots and stems of a plant? Are there plants with different structures?
 - c. What are the main functions of the roots and stems of a plant?
 - d. What are the different kinds of modified roots? Stems?
 - e. What is special about these modified roots and stems? Give examples.

3. Group Activity

Pass the Message Version 2.0

The students will be divided into 5-7 groups.

1. The groups will be asked to form a line.
2. The last person in each line will be the group's representative.
3. The representatives will go to the teacher.
4. The teacher will give the *message* to all the representatives.

5. The representative will go back to their group.
6. The representative will have to spell the *message* on the back of the person in front of him/her.
7. Procedure 6 will be repeated until the *message* is passed on to the person in front of the line.
8. The group who could tell the *message* first will get a point.
9. The first group to have two points will be the winner.

Here are the possible *messages* that could be used for the activity:

- roots
- stem
- stolons
- buds
- root cap
- epidermis
- cortex
- pericycle
- node

VIII. Synthesis and Valuing

Plant parts perform different functions that are related with each other. But there are certain situations and environments in which parts of plants need to perform different functions aside from their basic functions. Modified parts of plants, such as the roots and stem, have to adapt to their changing environments to for continuous growth, survival, and reproduction.

Change is the only constant thing in our lives. And we don't have any other choice but to adapt and face these changes.

We, Filipinos, are known for being highly adaptable to different cultures, people, and situations. One of the best proof of our adaptability is during calamities. We still still maintain our positive outlook in order to adapt and cope up with such situations. We know how to adjust by being resourceful, optimistic, helpful, and persevere. We always find ways to make the best out of every worse situations we are facing. This characteristic has been our key in order to continue living and growing--as individuals and as a community.

IX. Assignment

The class will be divided into 5-7 groups, depending on the class size. Each group will be asked to bring a root or stem that can be planted for the following day/meeting. The class will make a mini garden.

Some Filipino Scientists and their Contributions

Some Filipino Scientists and Their Contributions

Subject/Grade Level:	<i>High School Biology Class</i>
Title:	<i>Filipino Scientists</i>
Competency:	<i>Some Renowned Filipino Scientists and Their Contributions</i>
KCh Learner Values:	<i>Appreciation & Filipino Patriotism (Discover a number of prolific Filipino scientists and their works)</i>
Critical Issues:	Recognizing the role of science and Filipino scientists in national development

I. Objectives

At the end of the session, students should be able to:

- learn about some famous Filipino scientists
- discover the great contributions of Filipinos in the sciences
- develop an appreciation of Filipino scientists and their works
- boost Filipino pride and instil in them the passion of serving the nation through science

II. Essential Understanding

- The Philippines has a lot of bright minds who are aspiring to become successful and productive scientists.
- Filipinos are actively involved in the global arena of scientific researches and discoveries and are competitive enough to match the capabilities of foreign scientists.

III. Essential Questions

- In what field of science do Filipinos usually get involved with?
- The Philippines is a developing country who is relying greatly in agriculture. What field of science do you think needs to be prioritized in order to maximize national development?

IV. Summary of the Episode

This episode tackles about some of the renowned Filipino scientists whose contributions are so big and have helped a lot of people which garnered them numerous awards and put them to the stellar position in their respective fields. A brief background about each scientist was presented as well as their field of expertise that are indicated below:

Scientist	Field of Expertise
Dr. Leon Ma. Guerrero	Pharmacy
Dr. Felix Maramba	Biogas technology
Dr. Juan Salcedo	Nutrition, Health
Dr. Fe del Mundo	Pediatrics
Dr. Carmen Velasquez	Parasitology
Dr. Lourdes Cruz	Biochemistry
Dr. Memecio Mendiola	Agriculture

V. Pre Viewing (Motivation)

Before starting the lesson, ask the students to make a list of the foreign and Filipino scientists that they know. This would later on be collated to identify how familiar the students are with Filipino scientists.

Foreign Scientists/Contributions	Filipino Scientists/Contributions

VI. Viewing Proper

“What can you contribute to the society if you will become a scientist someday?”

VII. Post Viewing

1. Questions (about the episode)
 - a. What was the episode about?
 - b. Did you learn something from the program? What are those?
2. Review Questions (about the content)
 - a. Identify the scientists discussed in the video.
 - b. What were their works and contributions to science?
 - c. How did their works contributed to the development of our nation?
3. Group Activity

Identify one scientist discussed in the video and discuss his/her works. Make a list of the impact their contributions make in today's Philippine society. Discuss them in class after.

VIII. Synthesis and Valuing

Science is a very interesting field of study and it attracts the interest of students especially in the those who are in the primary grades. Many students would claim that they would like to become scientists in the future.

School textbooks have laid down their basic learning on the great contributions of mostly, foreign scientists from the classical era up to the contemporary time. If you are going to ask students to enumerate the Filipino scientists they know, you could only count a few, or nothing at all.

In reality, there are a lot of Filipino bright minds who are actively involved in the various fields of scientific researches in which a number of them gained both national and international recognitions. Knowing these facts is truly empowering to all aspiring scientists to prove that Filipinos can compete with foreign scientists and that we can address our nation's pressing issues by applying the wonders of science and technology.

Filipino scientists have an important role in using their knowledge and expertise to contribute to our nation's growth and development. They also contribute as mentors to a new generation of scientists. Also, many Filipino scientists have helped the government in crafting development policies for our country.

The National Academy of Science and Technology (NAST): (teachers can share this to students)

This is a national scientific body composed of preeminent Filipino scientists with the following mandates:

Advisory: To advise the President and the Cabinet on matters related to Science and Technology (Executive Order No. 818).

Recognition: To recognize outstanding achievements in Science and Technology as well as provide meaningful incentives to those engaged in Scientific and Technological Researches (P.D. 1003-A).

To engage in projects and programs designed to recognize outstanding achievements in science and to promote scientific productivity (Executive Order No. 818).

Scientific Linkages: To embark on programs traditionally and internationally expected of an academy of science (Executive Order No. 818)

IX. Homework

Ask the students to research one Filipino scientist that was not discussed in the program preferably a member of NAST. Have them submit a paper detailing their life, works and contributions to science and national development.

Theories and Evidences of Evolution

Theories and Evidences of Evolution

Prepared By: Mary Joy T. Marcelino

Subject/Grade Level: 1st Year Integrated Science
Title: Theories and Evidence of Evolution
Competency: Theories and Evidence of Evolution
KCh Learner Values: Fair-minded, Reflective, Evaluative
Critical Issues: How Human Evolved

I. Objectives

- cite evidences for the theory of evolution
- explain each theory of evolution
- describe the different group of organisms that had existed at a particular time segment through geological study

II. Essential Understanding

- **Biological evolution is genetic change in a population from one generation to another.**
- **Continuous evolution over many generations can result in the development of new varieties and species. Likewise, failure to evolve in response to environmental changes can, and often does, lead to extinction.**
- **Remains of animals and plants found in sedimentary rock deposits give us an indisputable record of past changes through vast periods of time.**
- **The fossil record also provides abundant evidence that the complex animals and plants of today were preceded by earlier simple ones. In addition, it shows that multicelled organisms evolved only after the first single-celled ones.**
- **Another clue to patterns of past evolution is found in the natural geographic distribution of related species.**

III. Essential Questions

- Where did living things come from and how did we evolved as human beings?
- What are the evidences of evolution?
- What is Charles Darwin's theory of evolution by natural selection all about?

IV. Summary of the Episode

This episode explains the theories of Darwin, speciation and natural selection, and the gene pool. It also talks about the implications of evolution to all living things and how natural selection works.

V. Pre Viewing (Motivation)

The class will be grouped into 4. The instructions are as follows:

- Create a googledoc with the permission that everyone who has the link can view it
- Googledoc Filename: EVOLUTION-<Group #>.i.e EVOLUTION-GroupI

Add the <teacher's email address> as editing member of the googledoc Copy the link for your googledoc and send it <teacher's email address>

- Make a diagram of the human evolution based on your own understanding. You can paste pictures and illustrations to make the diagram clear and creative. (10 mins)

VI. Viewing Proper

A video presentation would be played to tackle the theories and evidences of evolution. This episode explains the theories of Darwin, speciation and natural selection, and the gene pool.

“Theories and Evidence of Evolution”

Link: [Click here!](#)

VII. Post Viewing

1. Questions (re the episode)

- a. Did you like the program? Why or why not?
- b. What was the program about?

2. Review Questions (re content)

- a. What is the theory of evolution all about?
- b. What are the evidences of evolution cited on the video?
- c. What are the different group of organisms that had existed at a particular time segment through geological study?

3. Group Activity

- a. Ask the students to go back to their respective groups and revisit the diagram made on the first activity. The students are to amend/correct the diagram based on the facts gathered from the discussion and/or the video presentation.

VIII. Synthesis and Valuing

- 1. What do you think is/are the importance of studying the theories of evolution?**
(Reflective) (Evaluative)
- 2. How do we benefit from the remains/fossils that we discover from different eras?**
(Reflective)
- 3. How would you imagine your life if you have existed on the different eras before?**
(Reflective)
- 4. Do you think that Charles Darwin's theory of evolution by natural selection is the most reasonable theory of all? (Fair-minded) (Evaluative)**

IX. Homework

On the next meeting, ask the students to create a reflection about the lesson with a maximum of 200 words and submit it via email to: (teacher's email address)

Sources:

http://kchonline.ph/index.php?option=com_allvideoshare&view=video&slg=theories-and-evidence-of-evolution&orderby=latest
http://anthro.palomar.edu/evolve/evolve_3.htm