

LESSON PLAN
SUBJECT: BIOLOGY
TOPIC: DIGESTIVE SYSTEM

SCHOOL ID: PRIBADI BILINGUAL SENIOR HIGH SCHOOL BANDUNG

Class	:	10A & 10B	Academic Year	:	2020/2021
Semester	:	2			
Date	:	28 Sept - 2 Oct 2020	Duration	:	4x45 min

I. Kompetensi Inti (K-13) / Core of Competency

1. Internalise and practice the teachings of their religions.
2. internalise and exhibit honest, disciplined, responsible, aware/caring (cooperative, tolerant, and peaceful), courteous, responsive and proactive demeanours, as well as being part of the solution to various problems in effectively interacting with their social and natural environments and in placing themselves as reflections of the nation in global interactions.
3. Understand, apply and analyze factual, conceptual, procedural and **metacognitive** knowledge based on their curiosity upon sciences, technology, arts, culture and humanities, with insight into humanity, nationality, state and civilization associated with causes of phenomena and events, as well as to apply procedural knowledge in a specific field of study, which is of their talent and interest, to solve problems.
4. Process, reason and present in both concrete and abstract domains associated with the development of what they independently learn at school, and to be able to **act efficiently and creatively**, as well as to employ methods in accordance with scientific principles.

II. Kompetensi Dasar / Basic Competency

- 3.7 Analyzing the relationship between the tissue structures that make up the organs of the digestive system in relation to nutrition, bioprocesses and dysfunction that can occur in the human digestive system.

III. Learning Indicator

- Analyze the nutrients the human body needs on a daily basis from various sources of information
- Identifying one part of the digestive tract of ruminants, the human digestive tract through various information media and recognizing the position of the digestive glands and organs and their functions

IV. Learning Objective

Through series of teaching virtual methods (synchronous: zoom teleconference, collaborative Nearpod slide, asynchronous: platform Moodle LMS, virtual lab activity), the students of 10A and 10B are expected to be able to Analyze the nutrients the human body needs on a daily basis from various sources of information and identifying one part of the digestive tract of ruminants, the human digestive tract through various information media and recognizing the position of the digestive glands and organs and their functions.

V. Teaching Materials

- Laptop
- Internet connection
- IGCSE Course Book
- Notebook

VI. Teaching & Learning Process

1st Meeting

No.	Activities	Duration
1.	<i>Introduction/stimulation</i>	
	<ul style="list-style-type: none"> - Through zoom teleconferencing platform, teacher greets the students, takes attendance, asks class coordinator to lead the prayer. - As an introduction to the activity, teacher asks the students to take the pre-test about second section of biological molecules through Nearpod application and zoom teleconferencing application. - Teacher asks the students to observe a short video about nutrition (Apperception) 	15'
2	<i>Main Activities</i>	
	<p>SYNCHRONOUS SESSION</p> <ul style="list-style-type: none"> - Teacher asks the students for suggestions about how much of their body consists of water. (It is a little below 70 %.) Teacher also asks the students why we need water. The teacher is likely to get the answer 'so we don't get dehydrated', so the teacher will need to move the thinking on by asking what happens when we get dehydrated, which can then lead towards ideas about what water actually does in the body. This may be a good time to introduce the term 'metabolism'. (Seeking Information) - Teacher virtually shows the students a plate of different foods and asks them which ones contain carbohydrates. This can lead into a discussion of what carbohydrates are. Teacher could use popper beads to illustrate how sugar molecules link together to form disaccharides and polysaccharides. Teacher shows the students how sugar dissolves in water but starch does not. (The starch that is often used in biology experiments may be 'soluble' starch, but still does not easily dissolve in cold water.) Students will probably be able to tell the teacher that carbohydrates are energy foods. Teacher could show them video clips or photographs (there are plenty on the Internet) of athletes in a long-distance race, or tennis players, drinking fluids containing carbohydrates, and ask them why they do this. - Teacher asks the student to discuss the need for fats in living organisms. Teacher tells the students that fats contain twice as much energy per gram as carbohydrates. Teacher could discuss the relatively high fat content of the diet of Inuit people, or others who live in cold climates, and perhaps also investigate the diets of people carrying out strenuous activities in polar regions, such as polar explorers. Ensure that students also think about the uses of fats in plants; teacher could show them bottles of various cooking oils (groundnut, olive, corn and so on) and draw out the idea that these all come from plant seeds, and why seeds often 	60'

contain oils. (Oils are fats that are liquid at room temperature.) **(Acquisition of information)**

The bodies of all living things are made of many different kinds of chemicals. Most of our bodies are made up of water. We also contain carbohydrates, proteins and fats. These substances are what our cells are made of, each of them is vital for life.

55-62% of an adult human's body weight comes from water!



1. CARBOHYDRATES

Carbohydrates include starches and sugars.

Their molecules contain three kinds of atom – carbon (C), hydrogen (H), and oxygen (O).

A carbohydrate molecule has about twice as many hydrogen atoms as carbon or oxygen atoms.



SIMPLE AND COMPLEX SUGAR

	Monosaccharide: GLUCOSE (blood sugar), FRUCTOSE (fruit sugar), Galactose (milk sugar)
	Disaccharide: Maltose (glucose + glucose), Lactose (glucose + galactose), Sucrose (glucose + fructose)
	Polysaccharide: Starch, Glycogen, Cellulose

2. FATS

Fats are also known as lipids.

Like carbohydrates, fats contain only three kinds of atom – carbon, hydrogen and oxygen.

A fat molecule is made of lots of tiny molecules joined together. One of these is called a glycerol. Attached to the glycerol are three long molecules called fatty acids.

Fats are insoluble in water.

Fats that are liquid at room temperature are called oils.



3. PROTEIN

Protein molecules contain small kinds of atoms, which carbohydrates and fats do not.

As well as carbon, hydrogen and oxygen, they also contain nitrogen (N) and small amounts of sulphur (S).

Like polysaccharides, protein molecules are made of long chains of smaller molecules joined end to end.

These smaller molecules are called amino acids. There are about 20 different kinds of amino acid. Any of these 20 can be joined together in any order to make a protein molecule.




Common misunderstandings and misconceptions

- Many students will think that 'fats are bad for you', so it is important to emphasise their positive roles in the body as well as mentioning why too much high-fat food in the diet may be bad for health. This latter point is dealt with more fully later in the course.
- As for carbohydrates and fats, students should be able to tell the teacher examples of foods that contain protein. Students will probably be able to tell the teacher that proteins are needed for 'growth and repair', but they should now be introduced to some particular examples of proteins – for example, haemoglobin, enzymes, antibodies or insulin.

BLENDED/ASYNCHRONOUS SESSION

- Teacher asks the students to access the compiled teaching materials in LMS.
- In the LMS, teacher compiles all of the concepts of this topic into an all in one-interactive presentation slide

	 <ul style="list-style-type: none"> - Teacher asks the students to watch the previously recorded video about nutrition and answer the question embedded in moodle LMS (Acquisition of information) 	
3	<i>Closing Activities</i>	
	<ul style="list-style-type: none"> - Teacher reviews the lesson by randomly asks the questions related to the previously learnt lesson. (Synthesizing of knowledge) - Through Nearpod platform, teacher asks the students to briefly reflect the today's lesson activity by simply answer four questions: <p>What did you like in this lesson? What didn't you like in this lesson? What was easy in this lesson? What was hard in this lesson?</p>	15'

2nd meeting

No.	Activities	Duration
1.	<i>Introduction/stimulation</i>	
	<ul style="list-style-type: none"> - Through zoom teleconferencing platform, teacher greets the students, takes attendance, asks class coordinator to lead the prayer. - As an introduction to the activity, teacher asks the students to take the pre-test about second section of biological molecules through Nearpod application and zoom teleconferencing application. 	15'
2	<i>Main Activities</i>	
	<p>SYNCHRONOUS SESSION</p> <p>This is, in reality, a large collection of topics. There are many different possible routes through, and which you choose will depend to a large extent on the previous experience and knowledge of your students. It is well worth using some kind of assessment to find out what they already know and understand before you begin these topics. It is very easy for them to 'switch off' because they have covered it all before. If they have indeed covered much of this before, then it is important to try to ensure that everything you do has something new, fresh and challenging in it, to keep their interest.</p>	60'

	<ul style="list-style-type: none"> - Through zoom and nearpod platforms, teacher collaboratively explains about digestive system. - Digestion and the need for it is frequently completely misunderstood by students taking IGCSE examinations. A clear understanding of what digestion is, and why it is necessary, is fundamental to an understanding of the whole of the rest of this topic, so it is well worth taking time over. - Teacher follows this up with a discussion of how only small molecules can get through the wall of the alimentary canal and enter the body tissues. This can lead in to the ideas of mechanical and chemical digestion. Students find out the resource in their coursebook. (Seeking Information) - Teacher shows the students how first mechanical digestion and then chemical digestion produce small molecules of nutrients that can get through the wall of the intestine. - Teeth make a much easier topic for most students to deal with, and indeed many may already have covered this material in earlier years. Students usually enjoy looking at their own teeth, so tacher begins the lesson with virtual worksheet about checking your teeth. - Teacher shows digital dental X-rays are another potential source of information. - Teacher uses a three-dimensional model of the human body to show students the different regions of the alimentary canal and their positions in the body. - Teacher asks the students to do worksheet the structure of the digestive system to help students to learn the positions and names of the organs in the digestive system. (Acquisition of information) <p>Common misunderstandings and misconceptions</p> <ul style="list-style-type: none"> - It is very common for students to have difficulty with the concepts of digestion and absorption. They fail to understand that molecules need to move from inside the alimentary canal, through its walls, and into the blood (or lymph) before they can considered to be truly inside the body. - The students may confuse ingestion with indigestion. - It is very common for students to fail to understand that the alimentary canal is an unbranched tube which runs, uninterrupted, from mouth to anus. They may think that food goes through the pancreas and liver, or even directly to the kidneys. This misunderstanding can lead to students making statements about the kidneys 'excreting liquids from the foods that we eat'. - Some old textbooks describe enzymes being present in 'intestinal juice' in the small intestine, but this is not correct. The enzymes in the small intestine come either from pancreatic juice or from the cells covering the villi. - Many textbooks imply that water is absorbed only in the colon. Most absorption of water takes place in the small intestine, with only a relatively small quantity being absorbed in the colon. 	
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	lesson activity by simply answer four questions: What did you like in this lesson? What didn't you like in this lesson? What was easy in this lesson? What was hard in this lesson?	
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VII. Reflection

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VIII. Evaluation

a. Scoring Instruments	:	Online quiz and portfolios
b. Remedial and Extra Lesson	:	

Approved by
Principal

Bandung, 23 September 2020
Prepared by,

Rahmat Hidayat, S. Sos.

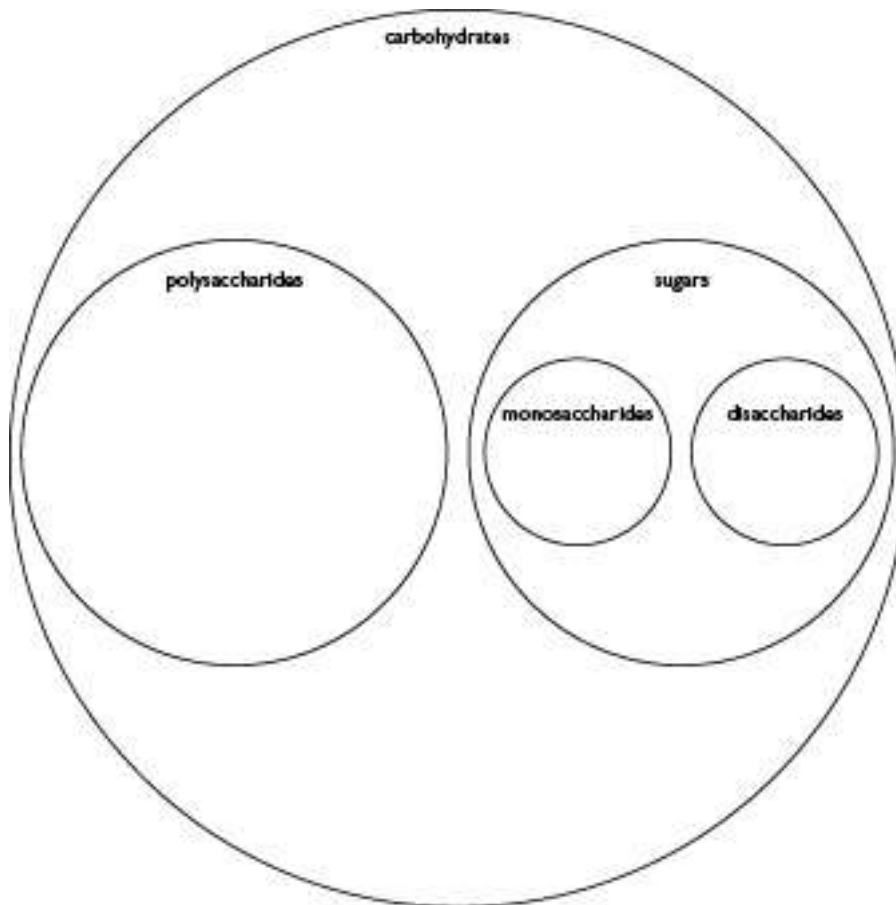
Muhamad Budiawan S. Si.

WORK SHEET 1

This list contains the names of several types of carbohydrate found in living organisms.

cellulose glucose glycogen maltose starch
sucrose

- 1 Write the name of each carbohydrate in the correct part of the diagram below.



- 2 On the diagram:
 - ◆ use red to indicate the carbohydrate that is used for storage in plants
 - ◆ use blue to indicate the carbohydrate that is used for storage in animals
 - ◆ use yellow to indicate the carbohydrate that is used for transport in plants
 - ◆ use green to indicate the carbohydrate that is used for transport in animals
 - ◆ use brown to indicate the carbohydrate that is used to build cell walls in plants
- 3 What property is shared by the carbohydrates you have indicated with red, blue and brown, which makes them suitable for their functions?

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.....

4 Name the carbohydrates from the list that would:

a give a brick-red colour when heated with Benedict's solution

.....
.....

b give a blue-black colour when tested with iodine solution.

.....
.....

WORKSHEET 2

Checking your teeth

Use a mirror to help you to count your teeth.

1 a How many teeth do you have on your *top* jaw?

.....

b How many of these are incisors?

.....

c How many are canines?

.....

d How many are premolars and molars?

.....

2 a How many teeth do you have on your *lower* jaw?

.....

b How many of these are incisors?

.....

c How many are canines?

.....

d How many are premolars and molars?

.....

3 Do you have fillings in any teeth? If so, which teeth are they in?

.....
.....

You must not do the rest of the worksheet in a laboratory, because it is not a good idea to eat in a lab.

4 a Take a bite out of an apple. Which teeth did you use?

.....
.....

b How are these adapted for this function?

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