

## Change the World One Yard at a Time

### Objectives

In this chapter the students will learn about

- How to diminish the use of fertilizers
- Microbes and how they systematically enhance the working system of the plant roots.
- The working system of Nitrogen Fixing Plants, Dynamic Accumulators



### 1. Warm-up

A. Work in pairs, prepare 4 small pieces of papers and write a, b, c, d on each piece of paper. Put them in a box and then randomly pick two pieces of paper. Take turns to talk about the pictures based on the letters that you have picked.

B. With the same partner from Activity A, discuss the meaning of “Change the World One Yard at a Time” You can start with something like, “I think *change the world one yard at a time* means...”

## 2. Conversation

### A. You did it last week, didn't you?

**Instruction:** Listen to the conversation and write the missing words Or phrases in the blanks.

**Premica:** What are you doing, Saran?

**Saran:** I am 1. \_\_\_\_\_ my plants.

**Premica:** But you just did it last week,  
2. \_\_\_\_\_?

**Saran:** Yes, I did. But I need them to 3. \_\_\_\_\_  
\_\_\_\_\_. So I think I should fertilize them weekly.

**Premica:** There should be some better way  
to keep your plants growing 4. \_\_\_\_\_  
chemicals.

**Saran:** That's what they say, but how?

**Premica:** 5. \_\_\_\_\_ you can plant them directly  
into the ground to give the roots more space.

**Saran:** But my 6. \_\_\_\_\_ is too small to plant all these plants.  
By the way, can you water that 7. \_\_\_\_\_ rose for me?

**Premica:** Sure!...uh oh! There's a big scary caterpillar there!

**Saran:** Oh, it has been two weeks since I last used 8. \_\_\_\_\_.



**B. Practice the conversation. You are challenged to change some information in the conversation to make the story more interesting.**

## C. Answer the questions

### Vocabulary

#### Fertilizer (n.):

substance, basically chemical, used to enhance the growth of plants.

#### Insecticide (n.):

substance used for killing insects

#### Caterpillar (n.):

or larva, is a worm-like stage of a butterfly's life.

1. What is Saran's belief in using fertilizer?  
Do you agree with this belief? Why or why not?
2. According to the conversation, what is Premica's concern about plant growing?
3. What is Saran implying when he says "That's what they say, but how?"
4. According to the conversation, what is the reason many people have for growing their plants in pots?
5. As signified in the last line of the conversation, what do you think Saran will do next?
6. Can you think of some negative effects that fertilizers have on people?

**D.** Look at the pictures, then (a) rank the products from the least to the most pesticide residues, and (b) pair the pictures with their correct information a-f on the right.

1. Blueberries



2. Nectarines



3. Celery



5. Lettuce



4. Grapes



6. strawberry



### Six Shocking Facts about Chemicals in Our Food Supplies.

- a. Thirteen chemicals are tested positive in every sample of this products
- b. It is full of vitamins and antioxidants but it was found with 42 different pesticide residues.
- c. Thirteen different pesticides were measured on a single sample of this product.
- d. 64 chemicals are found in this product
- e. Every single sample of this product is reported (USDA) to have measurable pesticide residues.
- f. You may have to rethink to eat this products it has 78 kinds of chemicals

Adapted from:

<http://www.takepart.com/photos/6-shocking-facts-about-pesticides-your-food-supply/lettuce>



### 3. Language Focus

**A. Look at the picture below, then complete the sentences.**

1. What?! The company is paying a big bonus this year. You are kidding, .....?

3. And we all will get it, .....?

2. You know me, .....?



Picture from: [www.socialimpactexchange.org](http://www.socialimpactexchange.org)

#### B. Conversation

John: Cut those apples for me, would you?

Sue: Sure, just one second.

John: You are not going to peel them, are you?

Sue: No way, I prefer to keep the skin, it is high in fiber.

John: But all fruits are grown with a lot of chemicals. You I know this, don't you?

Sue: Yes, I do. But I have washed it.

John: That's not enough. You know there are over 13 kinds of chemicals found in strawberries, and I guess in this apple too.

Sue: Alright. Here is the knife, get up and do it yourself.



C. In groups of 4, look for explanation on how to use Tag Question using your mobile phones or laptops. Then talk to your class what you have learnt. Then draw a class's conclusion.

#### Tag Question

In general questions in English are formed by using **question words** (who, what, where, when, why, how...) or **auxiliaries** or **modals** (can, do, have, will...) at the beginning of the sentences. However, tag questions are formed differently. Read the sentences below.

1. *Do you understand?*

*You don't understand, do you?*

2. *Is he joining us?*

*He is joining us, isn't he?*

*You don't understand, do you? And He is joining us, isn't he?* are tag questions which are asked in order to reconfirm or recheck the speaker's understanding or perception about something.

Therefore, the purpose of tag questions are something like "is that correct?" or "do you agree?"

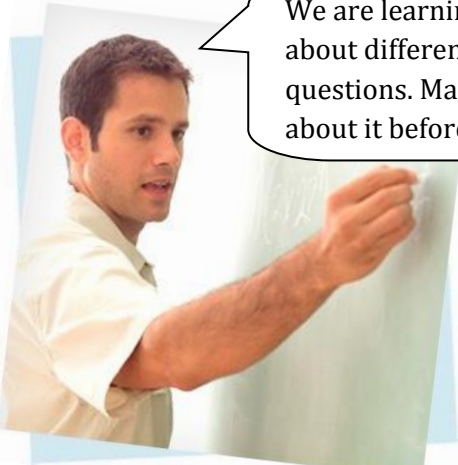
Let's imagine, during English class, a teacher is explaining how to use tag question, but when the teacher asks the students to make some tag questions no one can answer it. So the teacher asks,

"You don't understand, do you?" In this situation, the teacher may have an assumption that the students don't understand the lesson, and he wants to check with his students by asking the above question.


#### Your Turn!!

**You are challenged** to think of a situation, like the example above, then write a tag question about it, and explain what your tag question should mean in that situation. For example, if your sentence is "*I have told you this, haven't I?*" then you have to explain what does the speaker mean to say this.

**4. More about Tag Questions:** Make groups of seven students, provide each member with a letter (any from A-G). Students have 5 minutes to read one section below based on their letter. Then take turns teaching the whole group about what they read. Alternative! You can also ask students who have the same letter from all groups to sit together so they can work together on the same reading. After that they can go back and teach others in their group.



We are learning in more detail about different ways to use tag questions. Many of you have read about it before, haven't you?



I was very busy last night, professor. You are not going to test us on this, are you?



**B. Negative Adverbs** like *hardly, never, rarely, seldom, barely and scarcely* have negative meanings even though they are embedded in positive statement. The tag of the questions must therefore be *positive*. Look at the samples below.

- They **never** called you by your nickname, **did** they?  
*But, they **never** call you by your nickname, **do** they?*

- They **rarely** use any fertilizers in their yard, **do** they? *But They **rarely** used any fertilizers, **did** they?*

**Now write a sentence for adverbs like, hardly, seldom, barely, and scarcely.**



### A. Forming of tag questions

#### 1. Positive Statement+ Negative Tag as in the example below.

- We can diminish the use of chemicals in our garden, can't we?

In this sentence, *can* in the first part of the sentence is in positive form, therefore the tag must be changed to negative form. (can – can't).

- Danai will join a workshop on chemical reduction in home grown crops, won't he?

**Notice** that pronouns at the end of tag sentences do not have to take object form.

#### 2. Negative Statement + Positive Tag.

- Lettuce is not safe for us to eat, is it?

- We can't be sure of our food safety, can we?

Now, write statements or tags for the following tag questions.

1. Organic vegetables are safer than general vegetables, .....?
2. Because of modern agricultural methods, underground water can be contaminated, .....?
3. Strawberries..... full of vitamins and antioxidants, aren't they?
4. We..... peel apples, shouldn't we?

### C. Intonation

Intonation can signify purposes of tag questions (whether to really ask for answer or just to declare statements). The sentence below can be pronounced with both rising intonation (high pitch at the end of the sentence) and falling intonation (low pitch at the end of the sentence).

*It is a nice view, isn't it?*

What does this sentence mean if you pronounce it with high pitch? And what about low pitch?

### Think about this:

Look at the picture on the right, and decide whether you should pronounce the sentence "**It is hot in here, isn't it?**" with rising or falling intonation, and why do you think so. Talk to the friend next to you.



### D. Imperatives

Sometimes we use question tags with imperatives (invitations, orders), but the sentence remains an imperative and does not require a direct answer. We use **won't** for **invitations**. We use **can, can't, will, would** for **orders**.

- *Take a seat, won't you?*
- *Help me, can you? (friendly)*
- *Help me, can't you? (some irritable)*
- *Close the door, would you?*
- *Do it now, will you?*

### F. Asking for information or help

Notice that we often use tag questions to ask for information or help, starting with a negative statement. This is quite a friendly/polite way of making a request. For example, instead of saying "Where is the police station?" (not very polite), or "Do you know where the police station is?" (slightly more polite), we could say: "You wouldn't know where the police station is, would you?" Here are some more examples:

- You don't know of any good jobs, do you?
- You couldn't help me with my homework, could you?
- You haven't got \$10 to lend me, have you?

### E. Same-way tag questions

Although the basic structure of tag questions is positive-negative or negative-positive, it is sometimes possible to use a positive-positive or negative-negative structure. We use same-way tag questions to express interest, surprise, anger etc., and not to make real questions.

Look at these positive-positive tag questions:

- *So you're having a baby, are you?*
- *That's wonderful! She wants to marry him, does she?*
- *Some chance! So you think that's funny, do you?*  
*Think again.*

Negative-negative tag questions usually sound rather hostile: - *So you don't like my looks, don't you? (British English)*

### G. Some more special cases

There are some extra rules that you have to remember. Look at the sentences below and notice how the tag is applied in each sentence.

- *I am right, aren't I?*
- *You have to go, don't you?* (use auxiliary *do*)
- *I have been answering, haven't I?*  
(use first auxiliary)
- *Nothing came in the post, did it?*  
(treat statements with nothing, nobody etc., like negative statements)
- *Let's go, shall we?* (let's = let us)
- *He'd better do it, hadn't he?* (he had better: no auxiliary)

Adopted from:

<https://www.englishclub.com/grammar/verbs-questions-tag-special.htm>

**Exercise 1. Match the types of tag question below with their correct meanings.****Characteristics****Meanings**

- |  |  |
|--|--|
| 1. Some special types of tag questions | a. They are used to express interest, surprise or anger; they are not real questions.  |
| 2. Imperative tag questions            | b. Are based on the positive and negative relationship between the statement and the tag.  |
| 3. Asking for information or help      | c. Always starting with negative statement when asking for help in order to make it sounds polite  |
| 4. Negative adverbs                    | d. Using high and low pitch at the end of the sentence, high pitch shows that the sentence is a real question, while low pitch tells us that it is just a statement and we not need to provide an answer |
| 5. Same-way tag questions              | e. Words like <i>never</i> , <i>hardly</i> , <i>scarcely</i> , <i>rarely</i> used in positive statement to show negative meaning and the sentences with these words need positive tags.                  |
| 6. Intonation                          | f. Tag sentence usually started with a verb to show command or invitation. They do not need answers.   |
| 7. Basic rules of tag questions        | g. Can be seen in some sentences like, "Let's go, shall we?" or "I am the boss, aren't I?"   |

**Exercise 2. Write the correct tag part for the following tag questions.**

- The agriculturists in Thailand are facing a deficiency, .....?
- (Due to excessive production) Rubber plant farmers seldom make profit, .....?
- Clean up after yourself, .....? (irritating)
- As agricultural students, no one minds working in the sun, .....?
- You wouldn't have problem showing me your garden, .....?
- Many local farmers ..... working on their farm land, are they?
- You know how important agriculture is to our lives,.....?
- Wow! They are graduating this year, .....?
- Nothing can change your mind, .....?
- You.....mind explaining to me how this machine work,.....?  
(asking to a boss)



**Exercise 3** Use the words/phrases given to write a tag question about the pictures.



Example: /be/decide/what to eat = She is deciding what to eat, isn't she?



1. Jane/know/how to select fruits

.....



2. Kids/seldom/ eat vegetables

.....



3. Fruits/have/a lot of vitamins

.....



4. You/mind/to explain/how to fertilize vegetables (asking for explanation)

.....



5. Apples/be grown/a lot of chemicals

.....



6. Microbes/be able to live/any weather condition.

.....



7. Japanese farmers/rich (showing interest, surprise)

.....



### 5. Fertilizers: the more, the better? Changing Ideas



**A. Look at the pictures above, then answer the following questions. (try to use your own English)**

1. What is fertilizer? Why do many people use it?
2. What are the advantages and disadvantages of using fertilizers?
3. Why are the numbers on the two sacks different?

**B. Listen to the conversation and fill in the blanks with the words or phrases given below.**

*actually vegetables, pesticide, get rid of, instead of, options chemical, Teaming with Microbes*

**Conversation:** By the way, what are microbes actually?

**Premica:** Using a lot of chemicals is 1. \_\_\_\_\_ for us, isn't it?

**Saran:** I know but using insecticides and 2. \_\_\_\_\_ are effective ways to 3. \_\_\_\_\_ pests in our yards.

**Premica:** Yeah, but we also need clean 4. \_\_\_\_\_, don't we?

**Saran:** Yes, we do. I wish I had 5. \_\_\_\_\_ to grow my plants.

**Premica:** You might be interested in this book, have a look!

**Saran:** What? 6. \_\_\_\_\_? What is it about?

**Premica:** Well, in this book, microbes are used 7. \_\_\_\_\_ fertilizers.

**Saran:** By the way, what are microbes 8. actually?

**C. True or False?** Based on the conversation, write *T* if the sentence is true and write *F* if the sentence is false.

1. Premica wants Saran to change his way of growing plants. ....
2. Pesticide is a chemical used for killing insects only. ....
3. Insecticide is a chemical substance for killing insects and other pests. ....
4. Premica is concerned that the plants that Saran is Growing are not safe. ....
5. Saran does not want to change his method of planting. ....
6. Microbes are another kind of fertilizers ....
7. "By the way" is an expression used when changing the topic of a conversation. ....



**Microbes** = tiny organisms that can only be seen under a microscope, especially ones that cause illness or fermentation.

## D. Chemical fertilizers

### 1. Vocabulary

contamination, strip off, macronutrient, micronutrient, called it a day, consisted of, amendment unsustainable farming,

**Instructions:** Fill in the gaps with the words or phrases given above. You may need to change part of the words to fit them with the grammar of the given sentences.

- .....is a process or action to make something better or higher in quality.
- After he had finished ploughing, Tom ....., stopping all the jobs remaining during the day, and went home.
- Another meanings of this phrase is "to remove". Ex., "The damaged color of the car door must be .....before it is repainted".
- .....is an act of farming that is not based on the principles of ecological balance.
- In some areas of Khon Kaen, the groundwater is no longer clean due to the high levels of .....
- .....are three basic elements required by plants.
- The faculty of Agriculture in KKU, is ..... many different departments.
- .....are essential nutrients, such as minerals or vitamins, that are required by an organism in a little amount.



**2 A.** The effects of chemical fertilizers are not widely spoken about. This is partially because they are largely untested. We understand there is a risk of groundwater **contamination** and the environmental issues that it brings, but we're still not entirely sure what it means for our own health. To really understand this issue, we need to understand what chemical fertilizers actually do.

### What Is Fertilizer?

**B.** Fertilizer is any substance used to add nutrients to the soil to promote soil fertility and increase plant growth. Notice how nothing in there mentions the actual soil health; that's because not all fertilizers are made the same and not all are healthy for the soil health relies on a balance of **macronutrients** and **micronutrients**, as well as microbial health. It's vastly more **complicated** than simply adding nitrogen, phosphorus and potassium (NPK) to the ground and **calling it a day**.

**C. Why doesn't this work?** Because science doesn't always get it right. In the past, scientists once thought food only **consisted of** macronutrients, but have since discovered micronutrients, **antioxidants** and so on. The same goes for soil health: scientists have focused almost exclusively on NPK since their "discovery" in the mid-1800s. It's this reductionist science that has us assuming we understand the chemistry of Nature and soil, and thinking we can solve it with a quick application of chemical fertilizers. Unfortunately, as **unsustainable farming** and gardening practices continue, our soil is **stripped off** its health and we depend on **amendments** even greater. This leads to some pretty negative effects of chemical fertilizers.

**3. True or False.** Write T for the statements that are true, and write F for the statements that are false.

1. It is enough to keep the soil healthy just by adding macronutrients to it.
2. Fertilizer is always good because it adds fertility to the soil.
3. Knowing how chemical fertilizer works helps people understand how fertilizer affects their health.
4. People know the effects that contaminated water has on their health.
5. People don't talk about the effects of chemical fertilizer because they don't know much about them.

#### 4. Answer the following questions.

1. What is fertilizer?
2. What are the three factors contributing to the soil health?
3. Find the sentence or sentences in the passage which tell us that fertilizers are different and some are not good for soil.
4. What happened after the discovery of NPK in the mid-1800s?
5. What are examples of macronutrients and micronutrients mentioned in the passage?
6. Why didn't the scientists apply micronutrients to the development of soil health?
7. What is unsustainable farming?

**Let's think!** In your own words, describe how agricultural wastes cause pollution to the river. Then share your idea with the class.



#### E. Sources of pollution

Farmers put fertilizers and pesticides on their crops so that they grow better. But these fertilizers and pesticides can be washed through the soil by rain and end up in rivers. If large amounts of fertilizer or farm waste **drain** into a river, the **concentration** of nitrate and phosphate in the water increases considerably. Algae uses these **substances** to grow and **multiply** rapidly, turning the water green. This massive growth of algae, called **eutrophication**, leads to pollution. When the algae die they are broken down by bacteria which quickly multiply, using up all the oxygen in the water, which leads to the death of many organisms.

Chemical waste products from industrial processes are sometimes accidentally **discharged** into rivers. Examples of such **pollutants** include cyanide, zinc, lead, copper, cadmium and mercury. These substances may enter the water in such high concentrations that fish and other animals are killed immediately. Sometimes the pollutants enter a food chain and **accumulate** until they reach toxic levels, eventually killing birds, fish, and mammals.

**1. Match the words on the left with their meanings on the right.**

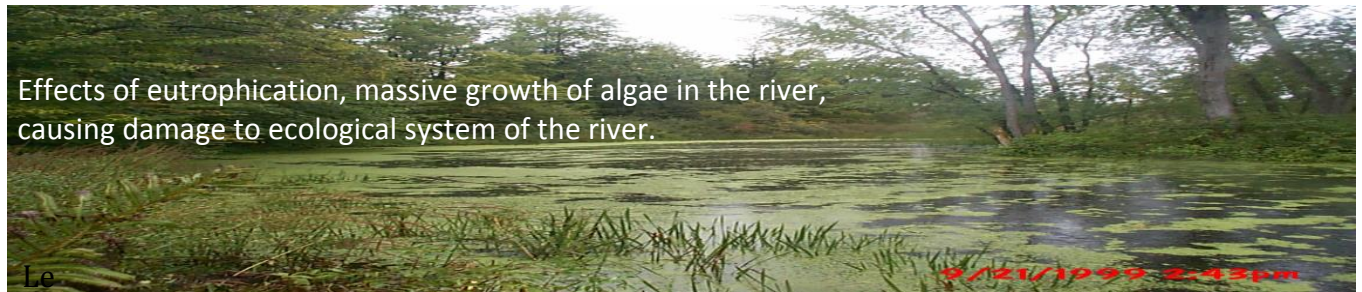
- |                        |  |
|------------------------|--|
| 1. Accumulate (v.)     | a. Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes dense growth of algae and death of other organism from lack of oxygen. |
| 2. Pollutant (n.)      | b. Particular type of matter that can be touched, not just seen, heard, or imagined.   |
| 3. Discharge (v.)      | c. To make liquid flow away from its source.   |
| 4. Concentration (n.)  | d. To increase greatly in number, usually rapidly.   |
| 5. Drain (v.)          | e. Substances, like smoke, sound that can pollute.   |
| 6. Multiply (v.)       | f. To increase (slowly over time) in quantity or number.   |
| 7. Substance (n.)      | g. To give or send out liquid.   |
| 8. Eutrophication (n.) | h. An amount of substance in a liquid or in another substance, or an ability to stay focused.  |

**2. Complete the sentences below using the words from Activity 1. Some words must be changed to fit with the grammar of the sentence. Some items have more than one possible answer.**

1. Phosphate and nitrate are .....that can be washed into rivers and they are nutrient resources of algae. A great number of bacteria uses up all oxygen in the water in order to decompose the dead algae. The lack of oxygen leads to the death of other aquatic organisms. This process is known as .....
2. The ..... of agricultural waste into water sources can be harmful when the level of ..... is high enough.
3. With excessive use of fertilizers around the river banks, the amount of dangerous chemicals in water can be dramatically .....
4. Different kinds of ..... that have been ..... in the rivers can be transferred to humans via the consumption of fish from polluted water.



## Negative Effects of Chemical Fertilizers



Effects of eutrophication, massive growth of algae in the river, causing damage to ecological system of the river.

### A. Write four sentences to describe the picture above.

1. ....
2. ....
3. ....
4. ....

### B. In pair, think of possible effects that chemical fertilizers have on humans.

**You can say something like;**

*"Chemicals from fertilizer can cause sickness and health problem"*

*"Fertilizer is not always good because it makes water to rot...."*

### C. Vocabulary: Match the words with their meanings and write the Thai meanings on the spaces provided.

Words	Meanings
1. Function (v) .....	a. Using strong, forceful methods especially to sell or persuade .
2. Aggressive (adj.) .....	b. State of having an unusually high blood pressure.
3. Portend (v) .....	c. A process of turning human wastes, basically from toilet and kitchen, into a safe-and usable fertilizer.
4. Inhibit (v) .....	d. To build or create something again after it has been damaged or destroyed.
5. Hypertension (n) .....	e. To perform purpose of a particular thing, or to perform the duties of a job.
6. Immune(adj.) .....	f. A period of ten-year time.
7. reconstruct (v) .....	g. To be a sign that something is likely to happen in the future.
8. Humanure (n) .....	h. To make something less likely to happen, or that discourages someone from doing something.
9. Decade (n) .....	i. To destroy something by breaking it into smaller parts.
10. Decompose (v).....	j. Protected against a particular disease or illness by particular substances in the blood.



## Negative Effects of Chemical Fertilizers

1. The biggest issue facing the use of chemical fertilizers is groundwater contamination. Nitrogen fertilizers break down into nitrates and travel easily through the soil. Because it is water-soluble and can remain in groundwater for decades, the addition of more nitrogen over the years has an accumulative effect. At the University of Wisconsin, Madison, they discovered the effects of chemical fertilizers are compounded when mixed with a single pesticide. They discovered altered **immune**, endocrine and nervous system **functions** in mice, as well as influence on children's and fetus's developing neurological, endocrine and immune systems. These influences "**portend** change in ability to learn and in patterns of **aggression**."

2. One popular fertilizer, urea, produces ammonia emanation, contributes to acid rain, groundwater contamination and ozone depletion due to release of nitrous oxide by **denitrification** process. With its increased use and projections of future use, this problem may increase several fold in the coming **decades**. Groundwater contamination has been linked to gastric cancer, goiter, birth malformations, and **hypertension**; testicular cancer and stomach cancer. Excessive air- and water-borne nitrogen from fertilizers may cause respiratory ailments, cardiac disease, and several cancers, as well as can "**inhibit** crop growth, increase allergenic pollen production, and potentially affect the dynamics of several vector-borne diseases, including West Nile virus, malaria, and cholera."

3. Perhaps one of the scariest effects of chemical fertilizers is something called **methemoglobinemia**. In infants it is alternatively known as Blue Baby Syndrome. The risk most often occurs when infants are given formula **reconstituted** with nitrate contaminated water. The condition causes a decrease in oxygen in the blood and results in a blue-grey skin color, causes **lethargy** and/or irritability and can lead to coma or death. I've been unable to find whether the same risk exists for breastfeeding babies whose mothers drank contaminated water.

Nitrogen groundwater contamination also contributes to marine "dead zones". The increase in the water-soluble nitrates creates an influx of plant-life, which eats up oxygen and starves out fish and **crustaceans**. This has an impact not only on the aquatic ecosystem, but on local societies who depend on food sourced from those areas.

4. And then there is the highly questionable use of raw **sewer sludge** as a fertilizer. Yes, you heard me right. In some countries, raw, uncomposted and untreated human waste is applied directly to crops and soil, a practice known as "night soil" since it's typically applied at night. The risk of disease is obvious and high and this practice should never be confused with "**humanure**", a long, highly involved process of **decomposing** human waste into a safe resource.

(<http://www.sustainablebabysteps.com/effects-of-chemical-fertilizers.html>)

**D. Answer the following questions about the negative effects of chemical fertilizers.**

1. What is the main idea of paragraph 1?  
.....
2. What does the word “it” underlined in paragraph 1 refer to?  
.....
3. What does the word “they” in paragraph 1 refer to?  
.....
4. What is the effect of the compound on children?  
.....
5. In paragraph 2, what is the writer’s prediction about the future problem caused by chemical fertilizers?  
.....  
.....
6. What is blue-baby syndrome and why is it dangerous?  
.....  
.....
7. According to the passage, what will happen to the baby if a breastfeeding mother drinks contaminated water?  
.....
8. Give 3 examples of the crustaceans  
.....
9. What is “night soil”? Is it good to use? Why or why not?  
.....  
.....
10. What is the difference between night soil and humanure?  
.....  
.....

**Paraphrasing**

Paraphrase means restating the original meaning in a new form of sentence without changing the meaning of the original statement. This can be done by using synonym or changing forms of the sentence. For example:

“Nitrates can travel easily through soil” can be restated as

- Nitrates are able to pass easily through soil.
- It is easy for nitrates to travel through soil.
- Nitrates can travel through soil easily.

**E. Paraphrase the sentences below.**

1. It is called “night soil” since it is applied at night.  
.....  
.....
2. The risk of disease is obvious  
.....  
.....  
.....
3. The scariest effects of chemical fertilizers is methemoglobinemia.  
.....  
.....  
.....

## Writing Skill

**Example 1** Writing is a difficult skill for many Thai students. But stay calm, practice makes perfect or at least better. There is a system to help you write better. Scan the passage below.

**Example 1: Family Violence can Affect Children's Lives**

Domestic violence and abuse can happen to anyone, yet the problem is often overlooked, excused or denied. This is especially true when it occurs in the family. **Family violence can affect children not only their physical but also their psychological behaviors.**

Children exposed to domestic violence are likely to **develop physical and behavioral problem**, such as regressing, exhibiting out of control behaviors, and imitating behaviors. Children may think that violence is an acceptable behavior of intimate relationships and become either the abused or the abuser. These children may complain of general ache and pain, such as headaches and stomachaches. They may also have irritable and irregular bowel habits, cold sores, nervous, anxious, short attention span, regression in development and they may have problems with bed-wetting.

Children living with family violence **suffer emotional and psychological trauma** from the impact of living in a household that is dominated by tension and fear. The emotional response of children who witness domestic violence may include fear, guilt, shame, sleep disturbances, sadness, depression, anger, and also have conflicting feelings towards their parents; for instance, distrust and affection often coexist for the abuser. The child becomes overprotection of the victim and feels sorry for them.

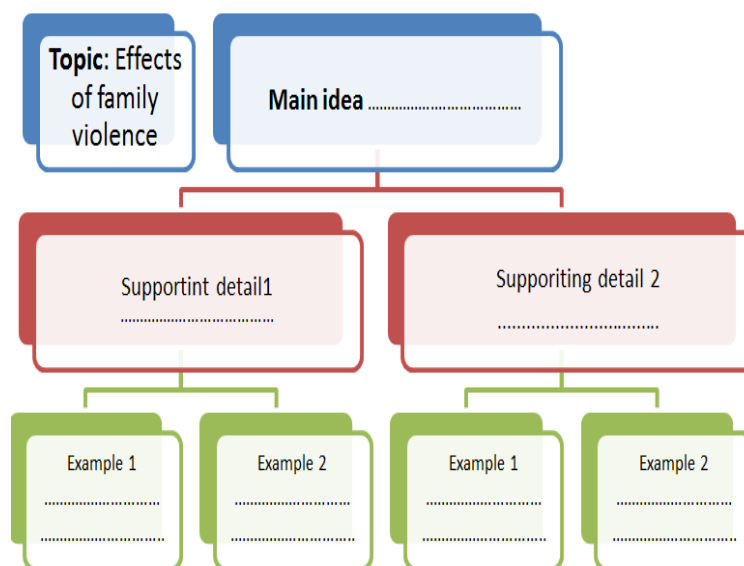
As you can see, children exposed to family violence affected bad effects in many ways. And may become long-term effect until they grew up. So the most important thing to help children heal and develop resiliency is the presence of a loving adult who can provide a safe environment that does not include violence in any form after a child has witnessed domestic violence and the one who can find way to discipline that do not involve hitting, yelling, or any form of verbally aggressive behavior at them. Remember that no one should live in fear of the person they love.

**Note:** This is taken from KKU student's writing task. Therefore its content is based on the student's perspective.

**A. Look at the passage again, then answer the questions below.**

- What do you think is the importance of the sentences in bold?
- How are the underlined words or phrases and the sentences in bold related?

**B. Fill the chart on the right with the words, phrases or sentences that are underlined or placed in bold in the passage.**







### Example 2: Soil Erosion

Soil is the earth's fragile skin that anchors all life on Earth. It is comprised of countless species and microorganisms that create a dynamic and complex ecosystem and is among the most precious resources to humans. But half of the topsoil on the planet has been lost in the last 150 years. Many factors are echoing to portend soil erosion, the problem that has wide range of effects that are surprising to us.

Soil erosion can be caused naturally by wind and water. But human activity is a true cause of erosion and it has surpassed its natural counterpart. The quick population growth increases higher demand to turn forest to farmland, field and pasture in order to produce enough foods. The transition to agriculture from natural vegetation requires cutting down a lot of trees. Furthermore, the repeated planting method, burning field, and chemical using performed by farmers can lead to the losing of soil structure and soil nutrient degradation. These are only some of the many other causes of soil erosion. The problem is common worldwide and it can cost more than what we ever think about.

The effects of soil erosion go beyond the loss of fertile land. It has led to increased pollution and sedimentation in streams and rivers, clogging these waterways and causing declines in fish and other species. And degraded lands are also often less able to hold onto water, which can worsen flooding. Sustainable land use can help to reduce the impacts of agriculture and livestock, preventing soil degradation and erosion and the loss of valuable land to desertification. The health of soil is a primary concern as our food supplies are rooted into it. Change need to be implemented in order to make our agricultural activities become more soil health friendly.

Adapted from: <http://www.worldwildlife.org/threats/soil-erosion-and-degradation>

#### A. Components of paragraph writing

When writing a paragraph, it is important to have a clear design of the idea. You need to ask yourself what you want to write about and what information you need to make your story most completed. Drawing mind map, listing, and heading can help organize your ideas and obtain enough information that you will need for a good writing. It is also important for you to think about how to start your story.

**B. Write a mind-map in this box to show the writing structure of the story above (you can use other scratch paper)**

## A Closer Look on Paragraph Structure

From the passage about “Soil Erosion”, we are looking at each part of the paragraph in detail

### A. Paragraph Introduction

Soil is the earth's fragile skin that anchors all life on Earth. It is comprised of countless species and microorganisms that create a dynamic and complex ecosystem and is among the most precious resources to humans. But half of the topsoil on the planet has been lost in the last 150 years. Many factors are echoing to portend soil erosion, the problem that has wide range of effects that are surprising to us.

*General statement about the importance of soil, this helps increase the readers' value on the topic. You can also start by asking question then deliberate your answer leading to the topic you are talking about. Remember, a good introduction begins from quite general and ends up very clear and specific*

*Stating conflict or problem. The underlined part shows how a tremendous amount of the world's topsoil that has been damaged in such a short time.*

*Statement of Main Idea. Basically, main idea of paragraph is placed around the bottom of the introduction. It tells readers what this paper is going to be about the causes and the effects of soil erosion. Don't write a long introduction without a point.*

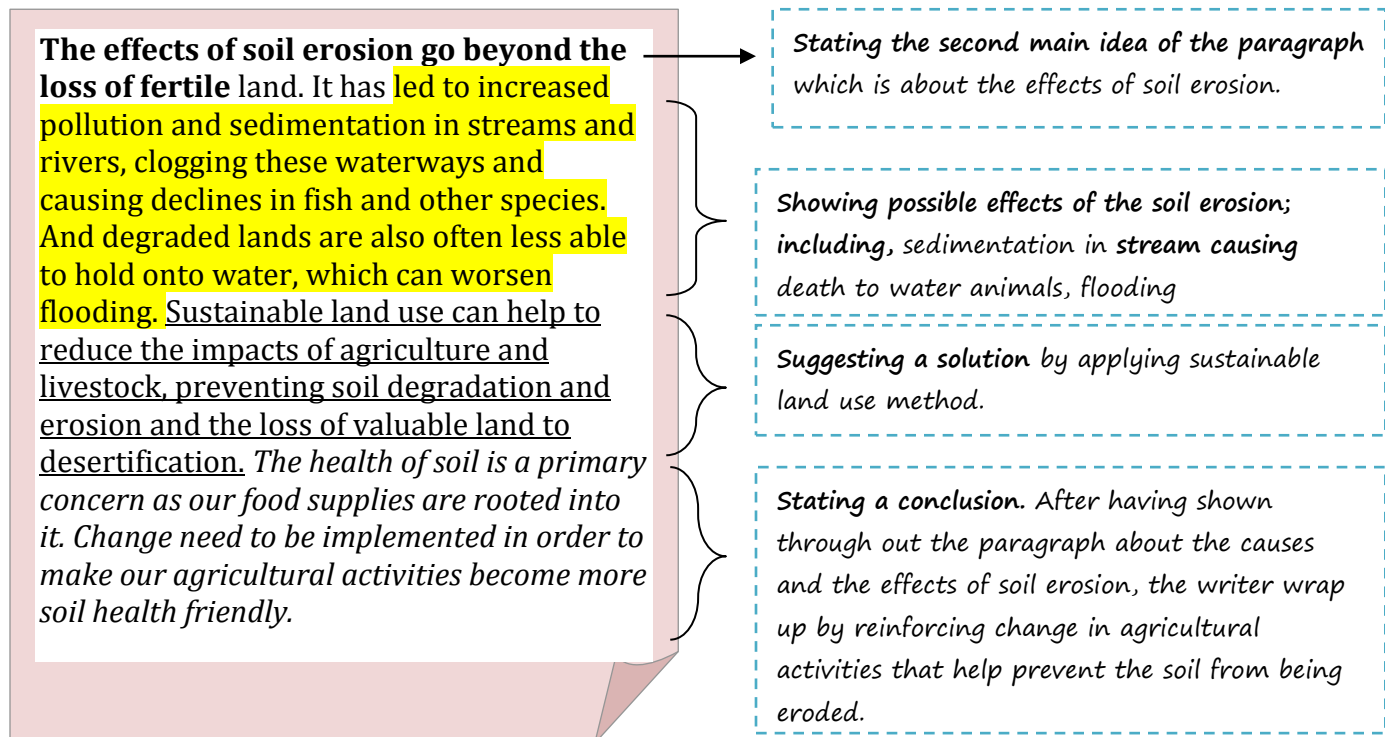
### B. Introducing the first main idea

Soil erosion can be caused naturally or by wind and water. But human activity is a true cause of erosion and it has surpassed its natural counterpart. The quick population growth increases higher demand to turn forest to farmland, field and pasture in order to produce enough foods. The transition to agriculture from natural vegetation requires cutting down a lot of trees. Furthermore, the repeated planting method, burning field, and chemical using performed by farmers can lead to the losing of soil structure and soil nutrient degradation. These are only some of the many other causes of soil erosion. The problem is common worldwide and it can cost more than what we ever think about.

*Stating the paragraph's first main idea, which is about the cause of soil erosion. Other remaining sentences give supporting details showing how human activities can cause soil problems..*

*Providing sample evidences that explain why human activities can lead to the soil erosion problem.*

### C. Introducing the paragraph second main idea



**Writing Activity 1:** Choose one of the four topics provided below. Then design your writing, using mind-map or listing in the box.

1. The future of agricultural works in Thailand
2. My agricultural hero
3. Agricultural show case in my hometown
4. Why did you decide to be an agricultural student

**Writing Activity 2: Developing Introduction**

Based on the topic you choose in Writing Activity 1, write a paragraph introduction of your topic in the box.

**Name**.....**Section**.....**Class No**.....

Topic: .....

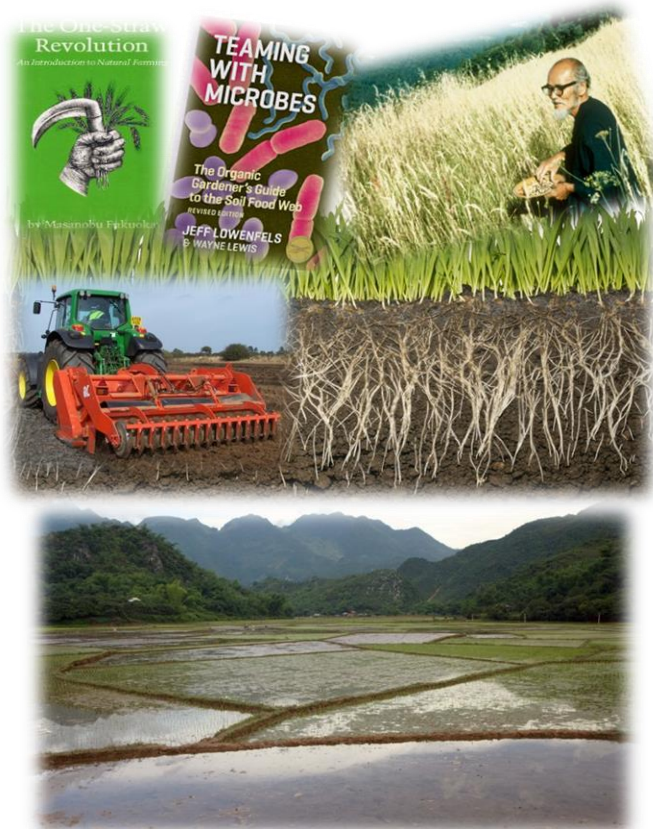
(Introduction)



## Enriching Soil Without Using Fertilizers

### A. Conversation

- Saran: Hi! Premica. You look busy.  
 Premica: Yes. I am working on the assignment from the English for agricultural class.  
 Saran: Ah! The one in which we have to study about an agricultural theory and then report about it to the class?  
 Premica: That's right. I am reading the One-Straw Revolution by Fukuoka.  
 Saran: That sounds interesting. What is it about?  
 Premica: It talks about how to enrich the soil without using fertilizers. And I am almost done. What about you?  
 Saran: I am reading "Teaming with Microbes" by Lewes and Lowenfels. It talks about using microbes to promote the balance in soil.



### B. Vocabulary

<b>Amendment</b>	Process of making something to be better, improvement
<b>Eliminate</b>	To make smaller in amount
<b>Inspire</b>	To increase someone's desire to do something
<b>Prevailing</b>	Most usual or widespread
<b>Heavy machinery</b>	Machines, like tractors and cranes, that are used for heavy duty jobs
<b>Plough</b>	Digging up the soil done basically to get it ready for planting
<b>Deplete</b>	Reduce greatly in quantity
<b>Investment</b>	Thing that is worth buying because it can return some future profit
<b>Predator and pray</b>	The hunter and the hunted in an ecosystem

### C. Pre-Reading Questions

1. What is flooding the rice field? Why do some farmers prefer to do this?
2. What will happen after using fertilizers for a long time?
3. What can be the disadvantage of modern farming?
4. How can soil health be protected without using fertilizers?
5. What is nitrogen fixing clover?

**Instruction:** Listen to the video and fill up the items 1-10.(Video Time 00.00-2.40 minutes)

**A.** More than once I've mentioned I don't use any sort of fertilizers or soil **amendments** in my garden. However, I don't know if I have provided the background as to how was I able to stop using these products and still have a **1**..... So today, I thought I'd spend a few minutes addressing this topic.

**B.** I would like to start by saying that I am not suggesting that anyone should just **2**..... using these products. Rather I would like to add it in a small way or an approach that I think that over time may reduce or even eliminate the needs for these products. But first let me do the illustration the Massunobu Fukuoka's book—the One-Straw Revolution. This book is not only **3**..... of my YouTube channel, but it also changes my way of thinking about growing food.



**C.** At the time when the modern agriculture was first taking a strong foothold into Japan, and the **prevailing** philosophy was **4**..... Fukuoka, instead of asking “what if we try this, what if we try that?” would ask, “what if I don't do this? “what if I don't do that?” So when the neighboring farms were buying a **heavy machinery** to **plough** the fields.

Fukuoka stopped ploughing altogether. He didn't use any **5**....., herbicides and pesticides. And as a raised farmer, he even **abandoned** the ancient practice of flooding the rice fields. But he had the result that was **compliant** or even superior to neighboring farms who invested a **6**..... in heavy machinery, fertilizers, pesticides and herbicides.



**D.** To built his soil, Fukuoka would return the organic matter back to the soil as **mulch**. In addition, he planted **7**..... clover crops and trees. Using this support, soil became richer and richer year after year. At the same time, the soil of the neighboring farms became **more and more** depleted **as the result of** the modern **8**....., **resulting in** the needs of the greater and greater investment in fertilizers. Finally, Fukuoka avoided manual cultures and planted a **9**....., thereby attracting wide variety of insects, birds and other wild lives which created a nature balance of **predators** and prays and help prevent any pests from causing too much damage without having to **10**.....

**E.** There is a greater more I can say about this wonderful little book. But I couldn't possibly do it just as in the time that I have here. **Suffice to say**, The One-Straw Revolution was an instrumental in leading me to a “less is more” approach to gardening.

**A. True or False?**

**Write T on the spaces if the statement is true and write F if the statement is false.**

1. The writer used to provide background showing how he stopped using fertilizer. ....
2. The writer wanted his audiences to stop using fertilizers as soon as possible. ....
3. The One-Straw Revolution influences the writer in many ways. ....
4. The story signals to us that Fukuoka is a good experimenter. ....
5. Modern agriculture was more effective for Fukuoka's neighbors but not for Fukuoka himself. ....
6. Manual culture in this story should mean growing the same kind of crops for along time. ....
7. The by-product of growing different variety of plants is the natural balance of predators and prays. ....
8. The *Less Is More* approach to gardening suggests that creating natural balance is a cheap investment but its product is fruitful. ....

**B. Answer the questions below.**

1. Soil amendment is closest in meaning to .....

2. What are the two effects that Fukuoka's book has on the writer?

.....  
.....

3. List 4 things that Fukuoka did in order to create balance to his soil

.....  
.....  
.....  
.....

4. Why did Fukuoka's neighbor become deficient after using modern agricultural technique?

.....  
.....

5. We can conclude that the success of farming depends on .....

.....

**C. Rephrasing:** Restate the sentences below without changing their original meanings.

**Example:** Fukuoka *abandoned* the *ancient* practice of flooding the rice fields.

Fukuoka *quitted* the *old* practice of flooding the rice fields.

1. To make the soil better, Fukuoka returned the organic matter back to the soil.

.....

2. Fukuoka's production was superior to his neighboring farms.

.....

3. I would spend a few minutes addressing this topic.

.....

4. The balance of predator and pray reduces the use of pesticides.

.....

5. There is a greater more I can say about this one little book.

.....

**D. Find the words/phrases from the passage that have the same meaning as the underlined part. Then write the answer in the space.**

**Example:** The farmers lost a lot of money in their farming investment. (deficit).

1. Trucks and tractors have been used a lot in modern agriculture.

.....

2. It is clear to say that this book is the bible for my gardening.

.....

3. In the Past, Thai farmers used to exploit animals like cows and buffaloes to dig up soil for farming.

.....

4. Straws and rotting leaves are good materials to cover the top soil.

.....

5. Using modern agricultural method in farming is more common nowadays.

.....



**Language Focus: Relationship between statements: sequence****Study the following sentences.**

1. If this heavy rain continues to fall **and so** the irrigation gate need to be opened.
2. Such damage is only temporary **and so** the plant will continue to grow.
3. **As/Since** the farmers continue to use fertilizers for a long time, the soil nutrients can be degraded.
4. Fukuoka regularly put organic matters back to his land. **Consequently/therefore/ Thus**/the soil became much better.
5. Fukuoka regularly put organic matters back to his land. The soil, **consequently /therefore/ thus/** became much better.

**Note:**

**As + Since** can be used at the beginning of the sentence to show cause statement. They mean the same as “because”. Therefore the second statement that follows usually shows the result of the first statement.

**Exercise 1.** Translate the Thai sentences below into English, begin the sentence with *As* or *Since*.

1. เพราะว่าดินไม่มีคุณภาพ ชาวนาต้องซื้อปุ๋ยมากขึ้น
2. เพราะว่า Fukuoka เป็นนักทดลองที่ดี เขาจึงสามารถแก้ปัญหาเรื่องคุณภาพดินได้
3. ด้วยเหตุว่าเครื่องจักรกลขนาดใหญ่ ราคาแพง ชาวนาจึงมีปัญหาขาดทุน
4. เพราะว่าทุกคนเข้าใจประเด็นนี้ดีแล้ว ครูจะไม่อธิบายซ้ำอีก
5. เพราะว่า Fukuoka ปลูกพืชหลากหลายชนิด แมลงและนกชนิดต่างๆ จึงกลับมาที่ที่ดินของเขา

**Exercise 2.** Make sentences from the words given then connect them, using *therefore*, *thus*, *consequently*.

**Example:** Water contaminated – fish die → The water is seriously contaminated, **therefore** the fish die.

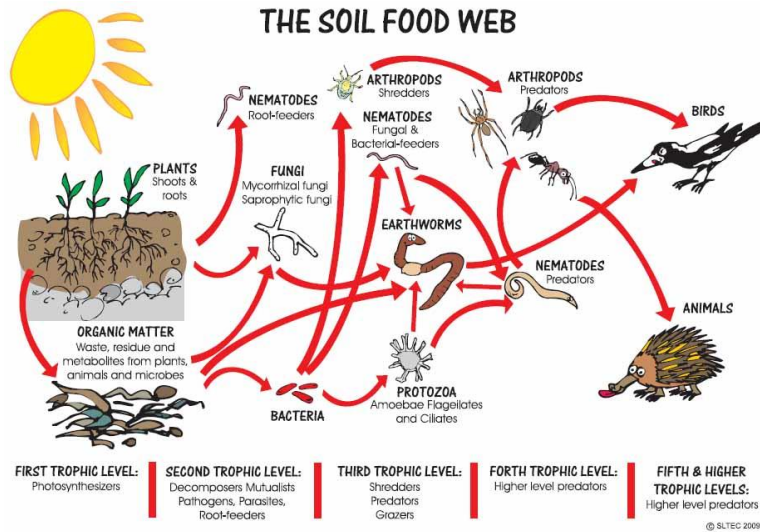
1. Fukuoka stop plough—not buy heavy machineries  
.....
2. The book valuable---the readers inspired.  
.....
3. Time too short---I finish all the talk.  
.....
4. farmers use chemical long time---degraded soil nutrients.  
.....

## Teaming With Microbes

Look at the video and fill the missing parts.

A. Another book that has a big influence on how I push gardening is “Teaming with **Microbes**” by Jett Lowenfels and Wayne Lewis. I have mentioned this book before in prior videos And I’ve even gone in some detail. So today, **1**.....

B. The central theme of this book is the best way to **2**..... and therefore your



garden is to promote the **Soil Food Web**. The Soil Food Web consists of millions of organisms living in the soil. These organisms **3**.....organic matter and make the nutrients in that matter available to plants. According to Lowenfels and Lewis, the best way to promote the soil food web is the three-pronged approach of compost, compost tea, and mulch.

C. Compost both

increases the population of **4**..... in the soil and increases the amount of organic matter in the soil. Those beneficial microbes help breakdown the organic matter and make the nutrients in the matter **5**.....

D. The brewing process of compost tea takes the beneficial microbes in the compost and dramatically increases their population by providing a **6**..... like unsulfured molasses and aeration. When you apply this tea to your garden, you dramatically increase the population of these beneficial microbes in your garden and again, as I have said before, these microbes help **7**..... in your soil available to plants.

E. And finally, mulch, among its many other benefits, provides the food source for organism and again increase the amount of nutrients available to plants. I’ve been using this three-pronged approach now for three years and haven’t purchased any soil amendments or fertilizers during that time. And my garden is **8**.....



F. So that, in a nutshell, is I have built my soil and continue to have a healthy garden while not using fertilizers or soil amendments. In the future, I’d like to

expand the pronged approach by growing more 9....., I'd also like to grow more **dynamic accumulators** of soil nutrients, plants like Coltsfoot, Stinging Nettle, Lamb's Quarters and use these plants as mulch at my garden, taking advantage of the nutrients they've accumulated and adding them to my garden beds. I hope you found this video informative. Thank you very much for watching and until next time remember, you can 10.....

### A. Answer the questions

1. Why does the writer want to talk only briefly about the book?

.....

2. Who are the authors of the book?

.....

3. What is the main component of the soil food web?

.....

4. Give two examples of organisms that help break down organic matters in soil.

.....

5. What are the components of the tree pronged approach?

.....

6. What happens after the tea is sprayed to the garden?

.....

7. What happens when microbes are added to the compose?

.....

8. What is the implication of **changing the world one yard at a time**?

.....

9. What is the difference between organism and organic matter?

.....

10. What are the two function of compose in maintaining quality of soil?

.....

## Dynamic Accumulators



### A. Warm Up

Look at the pictures above.  
Discuss why weeds are kept around the trees as it is in the pictures.

### B. Vocabulary

**Convert:** to change physically into another form.

**Deficient:** not having enough of something that is necessary or important.

**Detoxification:** the process of removing toxic substances or qualities. Medical treatment of an alcoholic or drug addict involving abstention from drink or drugs until the bloodstream is free of toxins.

**Exudates:** giving out liquid

**Symbiotic relationship:** a system in which two different species of organisms living together that may, but not always, benefit each other.

### C. Listen to a story about Dynamic Accumulators and fill up the gaps.

Dynamic accumulators are plants that gather certain micronutrients, macronutrients, or minerals and store them in their leaves. These plants can be used either for 1.....soil or for gathering a certain nutrient or mineral from an area. For instance, clovers will mine great quantities of nitrogen out of the air via a 2..... with bacteria. These bacteria 3..... gaseous nitrogen into a form available to the clover, and exchange this nitrogen for 4..... or sugars given by the clover. When the clover dies or is cut down, the green matter breaks down and releases the nitrogen into the soil.

These plants become rich in a certain substance and can then be cut down. This can be used as a fertilizer or as part of a fertilizer mix for other plants that may be 5..... in those particular nutrients. The use of a nitrogen dynamic accumulator, such as a clover patch, could potentially replace nitrogen-rich fertilizers. These types of plants play an important role in many [permaculture](http://en.wikipedia.org/wiki/Permaculture) guilds.

[http://en.wikipedia.org/wiki/Dynamic\\_accumulator](http://en.wikipedia.org/wiki/Dynamic_accumulator)

### D. Read the passage about *Dynamic Accumulators* and fill up the sentences below.

1. We can use dynamic accumulators like clover patch in substitution of.....
2. Dynamic Accumulators are plants rich in ....., .....and ..... which are stored in the.....of the plants.
3. Because each kind of dynamic accumulators has different nutrients, we need to..... different kinds of dynamic accumulating plants together to have enough.....needed by plants.
4. Clovers mines a great number of .....from the air via the help of.....
5. When the clovers die, it .....nitrogen back to the soil.

### E. Language Focus: Passive Voice

**Passive Voice:** (Subject + be (be, is, am, are, was, were, been) + v3) is used to describe subject that is an object of the verb. Example: “*The rain washes farm waste to the river*” can be changed into different passive sentences as below.

1. Farm waste *is washed* into the river.
2. Farm waste *is being washed* into the river.
3. Farm waste *was washed* into the river.
4. Farm waste *has been washed* into the river.
5. Farm waste *can/will/may/should/be* washed into the river.



Broken legs  
can be cured  
but broken  
heart can never  
be healed.

#### Passive Voice in Present Simple Tense (subject + is/am/are + past participle)

We use passive voice in present simple tense to talk about the action that is acted upon the sentence's subject to show current fact. Remember the relationships below.

I	am	} + V.3
You / We / They / The cars	are	
He / She/ It/ Tom /Jane	is	

1. The artificial rain *is made* to help the farmers grow their crops.
2. Many trees in KKU *are cut* each year to get more land for building construction.
3. Some agricultural students *are offered* to work for PC company.
4. The agricultural students' products *are displayed* at KKU Agricultural Fair every year.
5. Hydroponics vegetables *are grown* by the students.



**Write your own sentences using the Passive Voice in Present Simple Tense.**

6. ....
7. ....
8. ....
9. ....
10. ....



**Passive Voice in Present Continuous Tense (subject + is/am/are + being + past participle)**

We use passive voice in present continuous tense to talk about an on going action that is acted upon the sentence's subject. Passive structure in present continuous tense takes the following structures.

I	am	
You / We / They / The cars	are	being + V.3
He / She/ It/ Tom /Jane	is	

1. The rice saplings or the young rice *are being germinated*.
2. A list of contaminated products *are being reported* to the Food and Drugs Organization.

**Complete the sentences below with correct forms of passive voice in present continuous tense.**

3. The tents .....(set up) for the agriculture fair that is taking place next weekend.
4. The carp fish.....(classify) based on their colors and sizes.
5. The rumor about the death of the famous actor.....(spread) on the Internet.
6. The questions that will be used for the interview.....(prepare).
7. I.....(convince) to apply for the presidential candidate.
8. Soya bean.....(boil) before being made into soya milk.

**More Challenge! Write these sentences in English.**

9. หญ้าที่สนามฟุตบอลกำลังถูกตัดเพื่อเตรียมพร้อมสำหรับการแข่งขันกีฬาของมหาวิทยาลัยขอนแก่น
10. เงินกู้ยืมเพื่อการศึกษา กำลังถูกโอนเข้าบัญชีของนักศึกษา ก่อนเปิดภาคเรียน

**Passive Voice in Past Simple Tense (subject + was/were + past participle)**

When taking about the past action in which the subject of the sentence is the object of the action.

I	was	
You / We / They / The cars	were	+ V.3
He / She/ It/ Tom /Jane	was	

1. Farm work *was thought* to be a poor job in the past but it turns out to be a lucrative job now.
2. These cows *were inseminated* last month they should be pregnant now.

**Complete the sentences below with correct forms of passive voice in past simple tense.**

3. The Jasmine Rice 80.....(develop) by a team of Thai rice researchers, it can endure flood.
4. None of the students.....(blame) for the cause of the incidence.
5. It.....(find) that soaking rice before cooking can reduce more than 50 percent of residues.
6. The library.....(repaint) during the summer break last year.
7. Thai rice exportation .....(challenge) by the lower-price rice from Vietnam.
8. The demand to have price guaranteed for rubber products .....(deny) by the government.

**More Challenge! Write these sentences in English.**

9. มหาวิทยาลัยขอนแก่นถูกเลือก (select) ให้เป็นเจ้าภาพ (to host) ในการแข่งขันกีฬาโรงเรียนสาธิตเมื่อเดือนมกราคมที่ผ่านมา
10. นักศึกษาคณะเกษตรศาสตร์มหาวิทยาลัยขอนแก่นจำนวน 2 ถูกส่งไปฝึกงานที่ประเทศจีนเมื่อปีกลาย

**Passive Voice in Present Perfect Tense (subject + have/has + been + past participle)**

Perfect Tense is used to talk about the action that happens from the past yet the action or the result of the action lasts until to the time of the talk. Passive form can be merged into present perfect tense using the structure below.

I	have	
You / We / They / The cars	have	+ been + V.3
He / She/ It/ Tom /Jane	has	

1. The reputation of Thailand as the leading country for rice exportation *has been damaged* by the rice pledge scandal.
2. The towns around Pa-ngun island *have been renovated* after the hit of Tsunami many years before.

**Change the following sentences using correct passive voice form in present perfect tense.**

3. The farmers *have dried* the rice for a few days to get rid of the moisture.  
.....
4. The government *has warned* the farmers about severe drought. The government *has told* them to stop growing the aftermath rice.  
.....  
.....
5. Thai forefront companies have expanded their investment to other ASEAN countries.  
.....
6. More and more teenagers have paid their attention in doing hydroponics farming.  
.....

**Passive Voice plus other auxiliaries (subject + can/will/may/should + be + past participle)**

Different kinds of auxiliaries are used in the sentences to resemble different purposes of the talk. Below are examples showing how passive form can be merged with different auxiliaries.

- a. The chemicals form farm *can be washed* into the river.
- b. The artificial rain *will be made* to ease the drought problem.
- c. The road barrier and warning signs *should be removed* from right after construction.
- d. Their lands *may not be redeemed* if the farmers cannot make any profit this year.

**Which of the sentences above that shows...**

1. Future possibility in which something will be done?
2. Suggestion or opinion about how something be organized in the future?
3. Ability for something to be made happen in the future?
4. Future uncertainty, tendency for something to happen or not to happen?

**Write your own sentences using can, will, may, should + be + past participle.**

1. (can) .....  
(can).....
2. (will).....  
(will).....
3. (may).....  
(may).....
4. (should) .....  
(should) .....

**Exercise****Part 1:** Circle the correct answer.

Due to the rice pledge scandal, a survey about Thai rice stocking 1 ( is made / will be made / was made / were made) last year. A large number of officials 2 (will be sent / are sent / was sent / were sent) to inspect the rice stocking that 3 (is practiced / are practiced / was practiced / were practiced) throughout the country. It 4 (was finding / were found / was found / were finding) that many fake actions 5 ( was performed / will be performed / are performing / were performed). For example, some sand 6. ( are packed / are packing / were packing / was packed) in many sacks to show that the mills really have rice in their stocking. Moreover, in some big corrupted mills, iron-bar structures 7. ( should be build / were built / are building / was built) before thin layers of rice sacks 8. ( were piled / were piling / was piling / had been piled) over them. The mill owners wished the officials to 9. (be blinded / are blinded / have blinded / were blinded) by the tall pile of rice sacks that 10. (was being placed / was placed / have been placed / has placed) over the iron bar structure. This rice pledge corruption has caused tremendous lose of rice export from Thailand. It is expected that if the rice corruption continues, Thailand's reputation as the leading rice export country 11. ( are gone / will be gone / will go / is gone).

**Part 2:** Use the words in the brackets to write correct passive form of future actions for the given sentences (2 points each=10 points total).

**Example:** With excessive growth of algae, oxygen in water .....(deplete).

With excessive growth of algae, oxygen in water *will be depleted*.

1. Japan has set a plan that by the year 2020, the power used in houses .....  
..... (make) green power.
2. If the low agricultural prices continue to exist, Thai farmers ..... (force) to leave their farms to work in factories.
3. The construction of roads that link countries in ASEAN together ... .....  
(complete) in the near future.
4. With advanced knowledge of organic farming, it is hoped that the use of chemical fertilizer ..... (eliminate).
5. The expanding of rubber farming has reached its ceiling, it is expected that in the next ten years when all the rubber trees are giving out rubber, the rubber price ..... (drop) dramatically due to the over expanding of supplies.

**Using participle modifiers with completed and on-going actions.****Read the following sentences:**

- The tractor **that** is ploughing the field is imported from Japan.
- The compost **that** you fermented is made into a compost tea.
- The land **that** has been ploughed is ready for planting.
- Chemicals **that** are washed into the river cause algae to grow rapidly.

We can omit part of the sentences above to make them a one subject- one object sentence. Notice how sentences a-b are restructured.

- The tractor(~~that is~~) *ploughing the field* is imported from Japan.  
The *ploughing* tractor is imported from Japan.
- The *compost you fermented* is made into a compost tea.  
The *fermented compost* is made into a compost tea.



Now change sentences c-d based on the example above.

- .....
- .....

We can use **-ing verb as an adjective** in front of a noun and **phrasal verb with -ing after a noun** to show an on going action of the noun. For example;

- These *falling leaves* add matters to the soil.
- The man *talking at the podium* is the faculty's dean.
- The lice *living on cows' skin* are eaten by some birds.
- The workers *they are employing* are from Myanmar. (*they are employing* clarifies workers)

In addition, we can use **past participle verbs as adjectives in front of a noun** and **phrases after a noun** to show a completed action of the noun.

- Despite being damaged, the *flooded land* is filled with plenty of humus.
- These *dried straws* should not be burned but they should be used as a top soil cover.
- The land *you rented last year* is sold to a big company.
- The vegetables *grown in this region* are all organics.
- The mango trees *she bought from KCU's Agriculture Fair* are now giving productive fruits.

**Extended Activity**

Work in pair. Use past participle or verb -ing to clarify the giving words then make a sentence about it. For example: Dog---lost dog → *The lost dog is returned to its owner.*

Dog---The dog *you saw yesterday* is returned to its owner.

Flower   movie   computer   meeting   mobile phone

F. Rewrite the sentences below using participle modifiers or to clarify the subjects and change the verbs in brackets (...) to correct passive forms.

**Example:** The car that was stolen (find) parking near the mountain.

The stolen car is found parking near the mountain.

1. The gardener who is spraying the yard is (pay) weekly.

.....

2. The ideas that you suggested (deny) by the meeting.

.....

3. The concept of plant growing has (change) greatly in the past decades.

.....

4. The plants that are covering the soil should (grow) after harvesting season.

.....

5. The opinions that have been accepted will (implement) by the farmers.

.....

6. The fertilizers that we used (find) to be potentially risk for acid soil.

.....

7. Thai farmers who are flooding field (blame) for the over using of water in dry season.

.....

8. Vegetation that is hygienic (introduce) to the hill tribes because they are the main providers of vegetables in the country.

.....

9. The agricultural terms that are confusing (explain) before students start to read.

.....

10. The project that we are planning (interested) by many companies.

.....

G. Translate the following sentences to English using passive forms. Some words are given for you.

11. แรงงาน(labors)คนจะถูกแทนที่(substitute/replace) ด้วยเครื่องจักรในอนาคตอันใกล้

12. เมื่อเข้าสู่ประชาคมอาเซียนคนไทยจำนวนมากจะไม่ถูกจ้างงาน (employ)

13. คณะเกษตรศาสตร์มหาวิทยาลัยขอนแก่นถูกแบ่ง(divide)ออกเป็น8สาขาวิชา

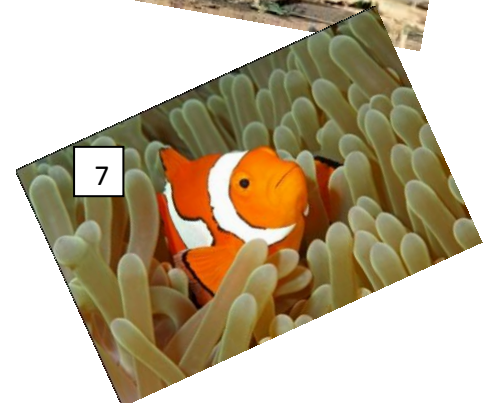
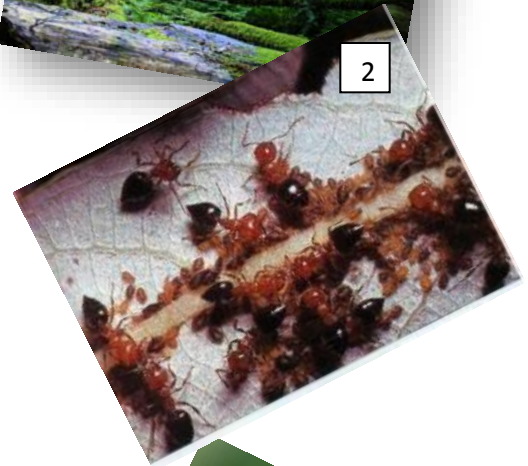


### G. Symbiosis Relationship

Symbiosis comes from the Greek words that mean “with” and “living.” It describes a close relationship between two organisms from different species. It is sometimes, but not always, beneficial to both parties. Based on the type of benefits that the interacting species obtain from the relationship, symbiosis relationship is divided into four categories:

- Commensalism
- Parasitism
- Mutualism
- Endosymbiosis and ectosymbiosis

Now watch a video on Symbiosis, what examples are given for each relationship.



### H. Match the terms (1-4) with their correct meanings (a-d). Then provide examples of organisms involved in each relationship.

1.....commensalism

2. ....parasitism

3. ....mutualism

4. ....endosymbiosis and ectosymbiosis

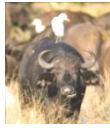
- a. One species living inside another one and, one species living on the surface of the other species
- b. A one side relationship in which only one organism is benefited from the relationship while another is not helped, damaged, or harmed by the relationship.
- c. One organism benefits from the relationship but at the expense of the other.
- d. A close relationship where both parties benefit

<http://examples.yourdictionary.com/examples-of-symbiosis.html>

**I. Look at the pictures on page 31, then write a description of the symbiosis relationship of the organisms based on the example given below.**

Example

(bird, buffalo)



This picture shows a mutual symbiotic relationship in which both *the* bird and the buffalo gain benefit from the relationship. The bird eats lice living on the buffalo's skin. And the buffalo gains benefit because lice sucking the buffalo's blood are eaten by the bird.

1.



(tree, moss)

This picture shows.....in which.....  
.....gains benefit from the relationship. The trees lose benefit because water and nutrients are.....by the moss.

2.

(ant,  
leaf)



This picture shows.....in which.....

3.



(bird, deer)

.....  
.....  
.....

4.

(parasite plant,  
tree)



.....  
.....  
.....

5.



(bee, flower)

.....  
.....  
.....

6.

(crocodile

bird)



.....  
.....  
.....

7.



(fish,

seaweed)

.....  
.....  
.....

8. Draw your own picture

.....  
.....  
.....

9. Draw your own picture

.....  
.....  
.....

10. Draw your own  
picture

.....  
.....  
.....

### Meat And Meat Production

#### A. Vocabulary

Find the meanings of the vocabularies below

Words	Meanings	Words	Meanings
1. Livestock		7. Contain	
2. Compose of		8. Consumption	
3. Bioactive component		9. Relatively	
4. Quantity		10. Double	
5. Derive		11. Meat processor	
6. Hygienic		12. Preference	

#### B. Fill the gaps in the passage below with the words from the table.

a. After cows are raised in (1) .....farm, they are sent to slaughterhouses. Then the (2).....will share the meat to their butcher clients.

b. Due to large amount of beef and pork (3)....., the prices per kilogram of these meats become (4).....high. The prices have increased by (5)..... since the last few years.

c. The meats (6).....from our local market is not so (7)..... The places where the meat is sold are not clean, the meat itself (8).....some kinds of chemicals, like potassium-nitrate (HNO<sub>3</sub>) which is added to meat products to make them look better.

d. Taking only small (9) .....of Din Pra Siw (HNO<sub>3</sub>) can be tolerant by our body. This chemical (10).....a very dangerous acid that can be harmful if taken too much.

**Activity:** Divide the students into two groups, A and B. Group A (The first half of the class based on their numbers) read the data set A, and group B (the second half of the class based on their numbers) read the data set B. Both are about the same story. Then do the exercises that follow. Students can do group reading but they have to do the test individually.

**Data Set A: (None-simplified)** Meat is the most valuable livestock product. Meat is composed of protein and amino acids, minerals, fats and fatty acids, vitamins and other bioactive components, and small quantities of carbohydrates. From the nutritional point of view, meat's importance is derived from its high quality protein, containing all essential amino acids and it's highly bioavailable minerals and vitamins.

While meat consumption has been relatively static in the developed world, annual per capita consumption of meat has doubled since 1980 in developing countries. Growing population and incomes, along with changing food preferences are increasing the demand for livestock products.

World meat production is projected to double by 2050, most of which is expected in developing countries. The growing meat market provides a significant opportunity for livestock farmers and meat processors in these countries. Nevertheless, increasing livestock production and the safe processing and marketing of hygienic meat and meat products represents a big challenge.

Adapted from: <http://www.fao.org/ag/againfo/themes/en/meat/home.html>

**Data Set B: (Simplified)** Meat is the most valuable livestock product. Meat has many nutrients such as protein, amino acid, minerals, fat and fatty acids, vitamins and other bioactive components, and small amount of carbohydrates. Based on nutrition value, meat is very important food because it provides high quality protein. It has all essential amino acids. Meat is also an organism source of minerals and vitamins.

In the developed countries, the amount of meat consumption is quite stable. However, the yearly consumption rate in the developing countries has doubled since 1980. The demand for meat products is increasing because of growing population, changing incomes and food preferences.

World meat production is expected to double by 2050, especially in developing countries. The growing meat market gives more chance for livestock farmers and meat processors in these countries. However, increasing livestock production and promoting safe and hygienic meat products is a big challenge.

**Choose the best answers for the following questions.**

1. The main idea of paragraph 1 is to.....
  - a. explain what meat is    b. show how meat is produce
  - c. tell why meat is good    d. value livestock product

2. From the passage, what nutrient should be least found in meat?  
a. carbohydrates    b. amino acids    c. vitamins    d. minerals
3. The main idea of paragraph 2 is to.....  
a. show increasing popularity of meat consumption.  
b. predict about the future trend of meat consumption.  
c. show that meat is more preferable in the developed country.  
d. compare amount of meat consumptions in the developed and the developing countries.
4. What is not mentioned in paragraph 2?  
a. The reasons for meats to become more popular.  
b. The growing of meat demand in the developing country.  
c. The number of meat consumption in the developed world.  
d. The increasing rate of meat consumption in the developing world.
5. If something has “doubled” it may become.....  
a. bigger in size    b. smaller in volume    c. better in quality    d. harder in practice
6. In paragraph 2, it is expected that people will have a better life in the future because they will.....  
a. live longer    b. be paid more    c. have more foods    d. have more population
7. What is true about paragraph 3?  
a. The developing country will have higher rate of meat production.  
b. Only the developing countries will have a double meat production.  
c. The developed and the developing countries will have the same rate of meat production.  
d. Both the developed and the developing countries will be able to double their meat production.
8. Who is expected to gain most profit from the situation in paragraph 3?  
a. meat production    b. livestock farming    c. meat market    d. meat processor
9. The word “big challenge” in paragraph 3 is closest in meaning to.....  
a. highly possible    b. very difficult    c. quite interesting    d. really exciting
10. What should be the best title of the story?  
a. Meat and livestock    b. Meat production  
c. Meat growing demand    d. Challenge in meat market



### After Reading Activity

Read the passages in the table again. The passages on the left column are authentic passage from the internet, they are kept as original writing. The passages on the right column are simplified version of the passages on the left. Compare them and then answer the questions below.

None-Simplified	Simplified
Meat is the most valuable livestock product. Meat is composed of protein and amino acids, minerals, fats and fatty acids, vitamins and other bioactive components, and small quantities of carbohydrates. From the nutritional point of view, meat's importance is derived from its high quality protein, containing all essential amino acids and it's highly bioavailable minerals and vitamins.	Meat is the most valuable livestock product. Meat has many nutrients such as protein, amino acid, minerals, fat and fatty acids, vitamins and other bioactive components, and small amount of carbohydrates. Based on nutrition value, meat is very important food because it provides high quality protein. It has all essential amino acids. Meat is also an organism source of minerals and vitamins.
While meat consumption has been relatively static in the developed world, annual per capita consumption of meat has doubled since 1980 in developing countries. Growing population and incomes, along with changing food preferences are increasing the demand for livestock products.	In the developed countries, the amount of meat consumption is quite stable. However, the consumption rate in the developing countries has doubled since 1980. The demand for meat products is increasing because of growing in population, changing incomes and food preferences.
World meat production is projected to double by 2050, most of which is expected in developing countries. The growing meat market provides a significant opportunity for livestock farmers and meat processors in these countries. Nevertheless, increasing livestock production and the safe processing and marketing of hygienic meat and meat products represents a big challenge.	World meat production is expected to double by 2050, especially in developing countries. The growing meat market gives more chance for livestock farmers and meat processors in these countries. However, increasing livestock production and promoting safe and hygienic meat products is a big challenge.

**Reading Survey: Application of Simplified Text to Agricultural ESP Classroom**

I am informed by the researcher that completing this form has no effect on my score of the course and no part of my information will be shared or given to the third party without regards to the purpose of this research. I deem this questionnaire important for the course book development for the course 050108. It is important that the information I give is reliable and it represents my true opinion about the questions. I have understood the terms and conditions of this questionnaire and I (.....) **agree** (.....) **do not agree** to be the informant of this research and I would like to sign my name herewith.

Signature.....Informant

Date: ...../...../2015

**Part 1: Informant's Information**

**Status:** (.....) student (.....) teacher **Age:** .....years old **Sex:** (.....) male (.....) female

1.1. Living in an English speaking country for more than 3 months? (.....) yes (.....) no

1.2 Level of English (.....) poor (.....) fair (.....) good (.....) very good

1.3 Do you think English will be important for your future job? (.....) yes (.....) no

1.4 Are you trying to learn more English? (.....) yes (.....) no

**Part 2: Opinion about simplified text.** Read the questions below and put the check mark (✓) at the column that most matches with your opinion. Each number has the following meanings; 1= strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5=strongly agree

Questions/level of agreement	1	2	3	4	5	Questions/level of agreement	1	2	3	4	5
1. Some sentences on the left column have difficult structures that are hard to understand.						5. You think you can learn better from the text that is understandable					
2. The sentences on the right column are easier to understand than the sentences on the left column.						6. Difficult texts make you feel bored and tired of learning English.					
3. The passages on both columns have identical meanings.						7. Learning from easy and simplified passages stops you from learning real English and does not make you become better in English.					
4. The replacement of difficult words with easier synonyms helps you understand the passage better						8. Simplified text is appropriate for agricultural students. You want text to be easy and understandable					

**Part 3: Reference Check**

3.1 Write some examples of sentences from the passage on the left column on page 36 that you do not understand until you have read the simplified version on the right column.

Sentences on the left column that you don't understand before you read the simplified text	Simplified sentences that make you understand

3.2 List 5 topics that you want to be included in the English course book for the course 050108: English for Sciences (Agriculture)

1. ....
2. ....
3. ....
4. ....
5. ....

### Producing Kobe Beef

**A. Vocabulary:** Look up for the meanings of the words and write the answers on the space provided.

Word	Meaning	Word	Meaning
Marble		Blend	
Intersperse		Appetite	
Layer		Leisurely	
Intense		Mixture	
Literally		Distribution	
Cattle		Tick	
Tender		Massage	

**Exercise: Fill the gaps with the words in the table.**

1. Their argument became more and more .....until they got into fighting in the end.
2. Humus in soil is a .....of rotten leaves and other organic substance.
3. Many ingredients are added into the stew soup to make the beef more .....
4. Kobe cows are given ..... to make them feel relax and produce better meat.
5. Allowing the cows to roam..... can increase their.....so that they can eat more grass.
6. The fat that .....between the layers of the muscle makes the Kobe beef more expensive.
7. Japanese beef farmers believe that rubbing skin of the cow helps in the .....of fat under the skin.
8. Farmers .....different ingredients such as corn and the byproducts of Tofu to make foods for the Kobe cows.

### The Making of Kobe Beef

**A. Reading Activity.** As appose to the reading activity on page 34, Group A students (the first half of the class, based on their numbers) have to read passage B. Then Group B students (the second half of the class, based on their numbers) have to read the passage A. Then both groups answer the question s that follow. Students can do group reading but they have to do the test individually.

#### Passage A: (None-Simplified)

The most important characteristic of Japanese beef is the white parts of fat in the meat, known as *sashi* in Japanese. The sashi is interspersed between layers of red meat and gives the beef a marbled pattern. This marbling is the most prized aspect of Japanese beef and cattle farmers go to great lengths to create intense patterns that make the meat literally melt in your mouth. In fact, the beef grading systems in most countries are directly related to how much marbled fat is present. In the US, prime beef must have 6-8% of marbled fat to qualify for the highest USDA grade. In order to achieve the highest quality grade for wagyu (A5), on the other hand, meat must be at least 25% marbled fat. While it may make the meat more tender and flavorful, high fat content is bad for you, right? Wrong. Fat in Japanese beef is primarily monounsaturated, which is known to lower ‘bad’ cholesterol! Monounsaturated fats also have a very low melting point, making the beef literally melt in your mouth. An steak of top quality A5 grade wagyu can cost \$500 or more in Tokyo’s fine dining scene.

Great care is taken to produce marbling and, apart from the being killed and eaten thing, cows in Japan live a king’s (or emperor’s) life. They are fed high quality grains and each farmer has their own blends and secret ingredients, such as soybeans and okara (a byproduct of making tofu). Water is also an important part in the cattle diet and local mineral water is often used to ensure the best quality product. To keep their appetite going during the hot summer months, cows are fed beer or sake. The cows are raised in stalls to help create fatty marbling, so they are taken outside for leisurely walks in the afternoon to get some sun and fresh air.

Farmers will also spit sake on their cows and rub it in with a straw hand brush, which they say helps balance the distribution of marble content in addition to keeping the lice and ticks away. In order to ensure their cows stay as relaxed as possible, some breeders are rumored to even play soothing music for them. Beer, massages, afternoon strolls, mineral water, classical music...what a life!



**Passage B: (Simplified)**

Japanese beef is special because there is sashi—Japanese word for white fat—between the layers of muscle. Because of sashi, Japanese beef looks like marbled pattern. Good marbled pattern makes the beef expensive because it makes the meat soft as if it melts in the mouth. So Japanese cattle farmers try to make the best beef. In most countries, beef grading is based on the fat it has. In the US, prime beef must have 6-8% of marbled fat to meet the standard of USDA. For the Wagyu (A5), however, good beef must have at least 25% of white fat. White fat makes the beef soft and more delicious but high fat content is bad for your, right? Wrong. Japanese beef is mostly monounsaturated fat that has lower “bad” cholesterol. This fat also has a very low melting point, so it seems like the beef can melt in the mouth. A steak made by top grade Japanese beef (A5) as served in some nice restaurants in Tokyo can cost 500 dollars or more.

It is a hard work to produce good fat. Cows are not raised only for being killed, cows in Japan live a king’s (or emperor’s) life. They are fed high quality grains and each farmer has their own mixture and secret ingredients, such as soybeans and okara (a byproduct of making tofu). Water is very important for the cattle diet, local mineral water is often used to create the best quality product. To help the cows to eat more during the hot summer months, cows are fed beer or sake. The cows are raised in stalls to help create fatty marbling, so they are taken outside for leisurely walks in the afternoon to get some sun and fresh air.

Farmers also rub the cows with some sake using straw hand brush. This helps balance the spreading of marble and it also get rid of lice and ticks. In order to keep the cows as relax as possible, it is said that some farmers play classical music for them. Beer, massages, afternoon strolls, mineral water, classical music...what a life!

**Answer the following questions.**

1. Where is sashi in Japanese beef?
  - a. Spread all over the beef
  - b. Between the muscle cells
  - c. Between skin and meat
  - d. Around the meat of the neck
2. Why does the writer talk about “marbled pattern” in the first paragraph?
  - a. It is the way the cows are feed.
  - b. It is what the beef looks like.
  - c. To show how expensive beef can be.
  - d. It shows how delicious the beef is.
3. What is true about having white fat in beef?
  - a. It is unhealthy.

- b. Fat makes beef cheaper.
  - c. Fatty beef is good only in USA and Japan.
  - d. Fat is used to tell about quality of beef.
4. What makes the beef to melt in the mouth?
- a. Low melting temperature    b. Amount of fat    c. Bad cholesterol    d. Japanese beef
5. “Cows in Japan live king’s (or emperor’s) life” What is not the reason for the word “emperor” to be added in this sentence?
- a. To make the story sound funny
  - b. To tell that Japanese cows have a good life.
  - c. To remind that there is an emperor, not a king in Japan.
  - d. To show how cows are respected in Japan.
6. The word “byproduct” is closest in meaning to .....
- a. Product that is close by.
  - b. Product that we can buy.
  - c. Unintended product from a production.
  - d. Products that are used for making other products.
7. From paragraph 2, what should not be foods for the Japanese cows?
- a. corns    b. barleys    c. malts    d. herbs.
8. What is the main idea of paragraph 1?
- a. How the beef is made    b. How the cows are feed
  - c. How important the fat is in beef.    d. How fat is sold in different countries.
9. According to the passage, which word does not mean “fat”?
- a. layers    b. marble    c. marbled pattern    d. sashi.
10. At the end of the story, the writer should feel.....
- a. happy    b. question    c. jealous    d. angry