

1, 2, 3 Infinity?

Subjects Taught: Science, Nutrition, Language Arts

Grade Levels: 3rd - 5th Grade

Brief Description: Connecting annuals, biennials, and perennials to the foods we eat helps students understand the nutrients those foods provide us and why the plants contain those nutrients. The focus will be on how plants store food and why.

Objectives: Students will:

1. Define annual, biennial, and perennial.
2. Identify plants for each category - annual, biennial, and perennial.
3. Describe how, where and why plants store food.
4. Link nutrients obtained from plant foods to food storage in that plant.
5. Set a personal goal to eat more fruits and vegetables.

Life Skills: brainstorming, classifying, comparing similarities and differences, investigating, making decisions, observing, researching, setting goals, sorting

Materials Needed:

- Lima bean seeds
- Peanuts (alternative to avoid peanut allergy – sunflower seeds)
- Computers with Internet access
- 3” x 5” cards, Post It notes, small paper squares or electronic text boxes that can be stored and reused.
- Writing materials

Time:

Introduction: 1 hour unless photosynthesis has not been taught

Activity One: 45 minutes to one hour

Activity Two: 30-45 minutes

Activity Three: 45 minutes plus time for research

Summary: 10 minutes

Preparation:

If photosynthesis has not been taught please see “We’re the Producers” in *Gardening for Grades* and/or “Gifts from the Sun” in *Project Food, Land & People* and teach photosynthesis so the students understand how plants make food from sunlight and elements in nature.

Vocabulary:

Annual, biennial, consumer, energy, perennial, producer, tuber

Background Information:

Annual, biennial, perennial, or one, two, three, infinity? What type of a plant are we eating and what does that have to do with nutrition? The type of plant and its life cycle has a huge impact on the nutrients we obtain. An annual plant lives one complete cycle in one year or more precisely one growing season – most often a few months. A biennial lives a complete lifecycle within two years or more precisely two growing seasons with a dormant period between the two growing seasons. A perennial lives for many years. The type of life cycle influences or controls the manner in which the plant stores food (energy). The mechanism for food storage determines the nutrients the food provides.

Florida Standards Met At-A-Glance

National Next Generation Science	3-LS1-1, 4-LS1-1, 5-PS3-1
English/Language Arts	3.RI.1.3, 3.RI.4.10, 4.RI.1.3, 4.RI.2.4, 4.RI.4.10, 5.RI.1.1, 5.RI.1.3, 5.RI.3.7, 5.RI.3.9, 5.RI.4.10, 3.W.3.7, 3.W.3.8, 4.W.3.7, 4.W.3.8, 4.W.3.9, 5.W.3.7, 5.W.3.8, 5.W.3.9, 3.SL.2.4, 4.SL.2.4, 5.SL.1.1, 5.SL.1.2, 5.SL.2.4, 3.L.3.6, 4.L.3.6, 5.L.3.6
Health	HE.4.B.3.5, HE.4.C.1.1, HE.5.B.4.1, HE.5.C.1.1
Science	SC.3.N.1.1, SC.3.L.17.1, SC.L.17.2, SC.4.N.1.1, SC.4.N.1.2, SC.4.L.16.4, SC.4.L.17.2, SC.4.14.2, SC.5.L.14.2

Annuals are generally grown from seeds and we often eat the resulting seeds as food. Seeds from annuals that are made into foods contain lipids (fats and oils), starch, protein, vitamins and minerals – all to feed the growing seedling. In fact, during milling, the wheat germ is separated from wheat (annual or biennial) because of the oil content. The oils are delicate and will go rancid once the wheat is crushed. So the germ is removed and stored in cooler temperatures to prevent spoiling and the milled flour can remain in storage longer. Other foods grown from annual seeds are harvested for vegetative plant parts that contain a lot of cellulose, which humans cannot digest so it provides fiber for the diet (cauliflower, broccoli, and the leaves of lettuce). But those plant parts are also rich in vitamins, minerals and phytonutrients. Some annual plants also produce fruits that contain seeds but the food we eat comes from the seed packet and the seed is only incidental to us. These annuals contain sugars and starches (cantaloupes, watermelon, and winter squash).

Foods from biennials are often not the fruit (seed) but the vegetative part of the plant that holds the food stored by the plant to initiate the second season's growth. These are often starchy roots, starchy leaves, starchy modified leaves (bulbs), starchy modified stems (tubers) and so provide us with carbohydrates. Because they have the food the plants need to re-grow, they also contain vitamins and minerals the plant will need to re-grow.

One would not expect to eat the stem or stalk of most perennials because they are woody trees and shrubs. Yet, asparagus (the stem of a perennial) fresh from the garden in spring is a delight and very nutritious and rhubarb adds a tangy jolt to desserts early in the growing season. Most perennials are responsible for the fruits we consume (apples, oranges etc.) rather than vegetative parts. To spread the seeds the fruits contain, they often come in a sweet, enticing package that animals



love to eat. These fruits provide sugars and cellulose (fiber) to our diet along with the vitamins and minerals we need. Or they may be nuts that are rich in healthy oils. The oils in nuts have the same role as the oils in annual seeds – germination for the new plant. But these seeds are larger and have more oil because their germination is tougher; they have to break through that woody shell in most cases. We also take advantage of the transport of sugars in deciduous trees (sugar maple) or stem storage in grasses (sugar cane) to produce sweeteners.

Introduction

1. Ask the students: “How do plants make and store food?” Review photosynthesis.
2. Review the information in “What We Eat - Part 2” about what parts of the plant we eat because that is where plants store food.
3. Break the students up into pairs and ask each pair to brainstorm and/or research as many raw foods as they can think of that we eat or with which we make a beverage. Give them categories: leaves, stems, roots, fruit, seeds, nuts, tubers, bulbs, seeds pods, flowers, etc. Have them start with the foods being grown in the school garden but move beyond that.
4. On 3”x5” cards, Post It® Notes, small, equal-sized paper, or electronic text boxes, have students write their category of plant part and item of raw food.
5. Use Teacher Resource on page 104 as a guide when completing Activities One, Two and Three.

As a sample their initial list may look like this:

Leaves	Lettuce, cabbage, spinach, parsley, endive, tea
Stems	Asparagus, celery, sugarcane, bamboo shoots
Roots	Carrots, beets, sugar beets, radish
Fruit	Apples, oranges, bananas, mangos, kiwi fruit, grapes, avocados
Seeds	Lima beans, peas, sweet corn, wheat, oats
Seed Pods	Sugar pea pods, green beans
Nuts	Walnuts, peanuts, pistachios, pecans, coconuts, cashews
Tubers	Potatoes, water chestnuts, jicama, jerusalem artichokes, yams
Bulbs	Onions, garlic, scallions
Flowers	Cauliflower, broccoli, artichokes

6. Make a master list from their input in a visual place or make sure it is available for frequent access electronically.
7. Explain that while some of these categories may be correct, others are not. This lesson will explore where and why plants store food, how that determines nutrients that we get from food, and how that relates to the plant's life cycle. (Keep the list posted as you proceed with the lesson. Eventually, you will reorganize it with only leaves, stem, roots, flowers, and fruits as the headings. But do not share that with students yet.)

Activity One:

1. Identify the stages of a plant's life cycle (germination, growth, reproduction, death).
2. Ask students what people and animals do if it gets too cold or too hot and dry to live outdoors. (*People live inside with heat or air conditioning. Animals grow heavy coats, find shelter, move into hibernation, or migrate south in the winter. Animals shed heavy coats, wallow in mud, travel to cooler climates, find shade, drink more water, etc in hot weather.*) Ask:
"What do plants do if it freezes for long periods of time or becomes too hot and dry to live? They can't travel north or south. They cannot move to other locations to find shelter or shade. Plants cannot move to seek water or take in water that is unavailable. Plants cannot hibernate." (*Plants have adapted in other ways. Plants can't hibernate but some do go dormant, for example.*)
3. Ask the students if they know what an annual is. Give them clues until they can determine what it means.
 - a. Clue 1: "The root of annual is the Latin word "an-num" or "annus" meaning "year."
 - b. Clue 2: "It refers to a type of plant."
 - c. Clue 3: "It involves the life cycle of that type of plant."
 - d. Clue 4: "An annual plant is a plant that lives its whole life within a _____."

4. Explain that for annual plants all of those stages are complete within one growing season which is one year or less. Some annual plants have longer life cycles than others but it always take place within one growing season. Annuals only grow when the conditions are right. They don't try to germinate and grow during the winter freezes or when there is not water or it is too hot. For example, lettuce will not germinate once the soil temperature exceeds 75° Fahrenheit.
5. Ask: "Which of the plants on the list (developed in the introduction) are grown as annuals?"

Grains: wheat, corn, oats, barley, rye, buckwheat, rice, quinoa, etc.

Seeds and seed pods consumed as vegetables: peas, green beans, lima beans, yellow snap beans, sweet corn, sugar pea pods, kidney beans, navy beans, black-eyed peas, etc.

Fruits grown from seeds: Cantaloupe, watermelon, cucumbers, summer squash, winter squash, zucchini, eggplant, tomatoes, peppers

Flowers: broccoli and cauliflower
6. Place a capital (A) next to each on the list to note that they are annuals.
7. Ask what they all have in common. Is there anything? (*They are all planted each year from seeds and the seeds can be found in seed catalogs or stores for purchase to plant in the spring.*)
8. State, "So, we have established that we grow annuals from seed every year and harvest the botanical fruits within a year regardless if they are eaten as fruits or vegetables. But the nutrition that we get depends on what part of the plant we actually eat."

Ask:
"What would the seed need to germinate – to break through the hard seed coat, push through the soil, grow several inches, spread leaves to reach the sun, grow a root to reach moisture and minerals?" (*It would need energy.*)
(As the students grow seedlings for the garden compare the size of the seed to the size of the seedling.)
"Where will the seedling get energy?" (*from inside the seed*)
"Where inside the seed?" (*Starch and lipids [fats and oils]*)
9. Dissect a large seed such as a lima bean to view the starch and crush a peanut on brown paper to see evidence of the oil. (If there are students with severe peanut allergies in the class, sunflower seed is a good alternative.) Explain that fats and oils contain two-and-a-quarter (4 calories versus 9 calories per gram) times the energy of starch which is a carbohydrate.



10. Ask: “Other than energy what will the seed need to germinate before it can start making its own food as a small plant?” (*Protein and vitamins and minerals to build the structure of the new plant.*)
- Explain further that the seed also has a hard seed coat to protect it and as we eat it that seed coat provides fiber if we eat whole grains.
 - Also explain that the seed coat is known as bran and it contains most of the vitamins and minerals. That is why eating whole grains rather than polished or processed grains is so important.
 - Note: If students include wheat on the list, identify it as spring wheat or winter wheat. Spring wheat is planted in the spring and is an annual. Winter wheat is planted in the fall, overwinters and re-grows in the spring and is a biennial.
11. Question whether all of the annuals we consume are in the form of seeds. (No) Ask:
 “How else do we eat annuals?” (*We eat them early before seeds are fully formed or when they are still sweet before the sugars turn to starch – green beans, yellow snap beans, peas, snow peas, sweet corn. Or lima beans, after the starch is formed but before they dry down.*)
 “Is there any other way we eat annuals?” (*We eat them as fruit, with the sweet or savory package that holds the seeds.*)
 “What is the purpose of the package that holds the seed? Why does the plant make it?” (*It protects the seed so it can ripen. It encourages animals to eat it [the fruit is digested but the seed coat prevents the seed from being digested] and spread the seed in their manure as they move around so the seed is distributed.*)
 “Is there any other purpose for the seed package?” (*It provides nutrients and moisture to the germinating seed if left to rot naturally. This helps the seed to grow while it is still fragile.*)
 “So what nutrients might the fruit contain?” (*Most fruits contain carbohydrates such as sugars, starch and cellulose, along with vitamins and minerals. Cellulose is a carbohydrate that we cannot digest so it gives us fiber.*)
12. Ask: “Might there be one more way we eat annuals?” (*Immature Flowers – broccoli, cauliflower*) Explain that because these are immature, they are primarily water, cellulose, vitamins and minerals so they provide fiber, vitamins and minerals to us nutritionally.
The oddities – (*There are other plants that we grow as annuals but do not eat either the seed or fruit so students would not recognize them readily as annuals one is lettuce and a second is spinach*) Place an (A) next to both and explain that we harvest leaf lettuce, head lettuce and spinach before it bolts flowers, and sets seed because

when it becomes bitter. Like flowers, these leaf crops are the vegetative part of the flower and provide mostly water, fiber, and small amounts of vitamins and minerals. (Potatoes are another oddity and we will discuss them after the lesson on biennials and perennials.)

- So, the category of flowers and the broccoli and cauliflower listed under that heading are correct. Place an (A) after each to indicate that they are annuals.
- However, seeds, seed pods, and fruits are all the botanical fruit of the plant. So, we need to put them under the heading of fruits. (An overarching heading of Botanical Fruits can be used in its place and the fruits, seeds, and seed pod headings can be used as subheadings if that makes it clearer to students.)
- Place an (A) next to the annuals as indicated in the Answer Key of this lesson.

Activity Two:

- Ask the students if they know what a biennial is. Share that the prefix bi- means two, and the root of the word goes back once again to the Latin for year, although it is harder to see than the word annual is. Share that biennial is a plant that completes its life cycle within two-years.
- Share that in order to survive from one year to another, the plant has to store food. This is to survive either winter freezing in temperate climates or a dry season that occurs in most tropical climates. So the top of the plant dies back and the food stored somewhere in the plant is used to rejuvenate the plant.
- Have the students divide into teams of two and ask them to brainstorm and research where plants store food, share what that food might be for the plant and how that affects the nutrients we receive from foods. (*Plants can store food in leaves, roots, stems and that stored food is mainly carbohydrates – sugars and starches.*)
 The University of Florida Extension has an excellent website for student research by category at www.edis.ifas.ufl.edu/topic_vegetables_by_type as a place to begin.
- Have each group identify which vegetables are biennials (*beets, Brussels sprouts, cabbage, carrots, celery, chard, collard greens, endive, kale, kohlrabi, leeks, onions, parsley, parsnip, rutabaga, salsify, and turnips*).
The oddities – In warm climates, cauliflower and broccoli behave as biennials because they need cool weather to initiate blooming.
- State: “So, these plants take two years to germinate, grow, reproduce, and die.” Ask:
 “Do we eat the seeds of these plants? (*Mainly no, we eat the stored food. We do eat celery seed for flavoring in pickles and sometimes in cole slaw.*)

“So, when do we pick these vegetables?” (*Before they flower and develop seed. We harvest them at the end of the first growing season. So we actually grow biennials as annuals but we harvest the vegetative storage portion of the crop.*)

6. Have the students place a (B) next to the biennials on the list. See below:
7. What have students learned about how these plants store food, what that means to the structures and to human nutrition? Should any changes be made to the list? (*All of the bulbs are really modified leaves and should be moved under that heading.*)



Activity Three:

1. Are the rest of the fruits and vegetables on the list perennials? Ask the students what they believe the word perennials means? (*Again, it comes from Latin words “per” meaning through and “annum” or “annus” meaning year.*) So perennial in Latin means through the years and it means that these plants live through the years or for many years.
2. Explain that the title of this lesson is 1, 2, 3 Infinity? And this is what the title means
 1 for annuals that live one year or one growing season.
 2 for biennials that live two years or two growing season.
 3 for perennials that live three or more years or growing seasons.
 But infinity? Can anything live forever: Probably not forever, but scientists are always looking for the oldest plants and animals living on the earth. How long can a plant live?
3. Have the students research what the oldest living plants are on the planet, where they are, what their climate is like, and how they manage to survive. Each student should provide a list of three plants that they believe to be the oldest and compete for the oldest. Students should provide information sources to document the credibility of the claim.

Possibilities include:

- *A Mediterranean Sea grass is believed to be at least 100,000 years old.*
 - *The oldest known plant clone is the King’s Holly (Lomatia) of Tasmania estimated by scientists to be 43,000 years old.*
 - *There are two shrubs competing for the oldest living shrub. One group claims that it is a Box Huckleberry in Pennsylvania estimated to be 13,000 years old but verification is still underway. Others believe it is a creosote bush in the Mojave Desert of the United States estimated by a botanist to be more than 11,700 years old.*
 - *The oldest living spruce tree is now believed to be a spruce tree in Sweden that is 9,550 years old.*
 - *A Great Basin Bristlecone Pine tree known as Methuselah in California is estimated to be 4,846 years old whose age was scientifically verified by crossdating a core sampling in 1957. It was still living as of 2014. In 2013, another Bristlecone tree located in the same general area was discovered and is estimated to be 5,065 years old.*
4. Ask the students to report their findings and compete for oldest living perennial.
 5. Discuss with students how these perennials survive; how those capabilities reflect perennials grown for food; and why this has meaning to the nutrition we receive from those foods. Perennials store food to survive times when they cannot obtain water, nutrients or undergo photosynthesis. That stored food might be found in sap that can be converted to syrup or sugars (maple syrup, sugarcane). Some of those perennials survive by cloning themselves. Scientists are proving that the longest living plants are often clones of the original plant that keeps recreating itself, vegetatively.
 6. Explain that the perennial plant may be a tree that produces seed each year in the form of a fruit or nut crop. Fruits provide a support structure for the seed (sugars, starches) or they contain starches, protein and a lot of oils just as other seeds do to facilitate germination (walnuts, pecans, avocados). In the case of artichokes, we harvest the not too attractive flower in its immature stage.
 Plants that reproduce with tubers or rhizomes such as potatoes contain stored food (starch, vitamins and minerals) to fuel the growth of a genetically identical plant. There are tubers that are modified stems (potatoes) and there are tubers that are modified roots (sweet potatoes). So those categories need to be shifted – see chart on page 104.

Potatoes are **the oddity** for this group of plants. They do complete a life cycle of an annual by producing seeds within a single growing season. But they also produce tubers (modified stems) that will grow into an identical clone of the parent plant as perennials do. However, there is more to it. We do not reproduce potatoes by seeds but by potato pieces known as seed potatoes. And we do not consume the fruit of the potatoes – it is poisonous. So, although we grow potatoes as annuals, they are placed here to acknowledge that they do not fit easily in a single category. Jicama is in the same category producing seeds and tubers after the first growing season although it may take the full year to do so. The seeds of the jicama are also poisonous but new plants are grown from seeds.

Of course, as with all food from plants, perennials provide vitamins and minerals and fiber.

7. Have students complete the listing by adding a (P) after the perennials and giving potatoes and jicama both (A&P).

Summary Activity:

1. Hold a class discussion summarizing what the class has learned and what impact this has on their health. Use these questions to discuss:
 - a. “Why should we eat vegetables? How does eating vegetables strengthen your health?” (*Various vegetables provide a nice variety of vitamins and minerals needed for bodily functions.*)
 - b. “Why should we eat fruits? How does eating fruits improve your health?” (*Various fruits provide a nice variety of vitamins and minerals needed for bodily functions.*)
 - c. “Why should we eat a **variety** of fruits and vegetables? How does that affect the nutrients we get?” (*Different nutrients are provided by each fruit or vegetable and are provided in varying amounts. An assortment of fruits and vegetables provides the whole spectrum of nutrients.*)
 - d. “What are some potential problems or health concerns that could arise if you do not get a good mixture of different fruits and vegetables on a weekly basis?”



(Short term impacts will center around students not performing at optimal levels. Long term impacts are far more serious and lasting. Deficiency diseases can effect teeth, gums, skin, bones, immune systems, eyesight, blood and the heart.)

- e. “Why is it important to eat whole grains and not just refined foods?” (*Refined grains are missing the outer husk of the seed or bran. Much of the fiber, vitamins and nutrients are found in this part of the seed. Refined grains lack those nutrients.*)
 - f. “How will learning this information change the choices you make? If so, why? If not, why not? Will you be willing to try new vegetables? If so, why? If not, why not?”
2. Ask each student to write down a specific goal about eating new fruits and vegetables – what they are going to try, the serving size, the number of servings, how often and how will this will help them meet their nutritional needs. Ask each student to turn in their goals to you and report back when they have met their goals.

Evaluation Options:

1. Evaluate student research cooperation and participation.
2. In pairs, have students create a poem, chant or rap using what they have learned to categorize plants, the plant part used for food, and the nutrients provided.
3. Use the quiz included in this lesson.
4. When students have met the goal set in the summary activity give him or her an ‘A’ for the assignment. Have them then write a letter of congratulations for this achievement.
5. Have students create food webs that include annuals, biennials, and perennials, and the animals (including humans) that eat foods from each of these.

Extensions and Variations:

1. Have students add pictures of each fruit or vegetable as they research.
2. Have students create a meal plan including one annual, one biennial and one perennial fruit or vegetable in a meal every day for a week without repeating any item. So, this would include at least 7 annuals, 7 biennials, and 7 perennials for the week without repetition.
3. Include parents in the planning so they include more fruits and vegetables in family meals.
4. Have students make a map of the grocery store where their family shops and identify where each food group is located. Discuss what the maps make clear to the students. (*Fruits, vegetables, and dairy products are found on the outside of the store while processed and refined products,*

snack foods, sweets, and other non-food items are found inside the center of the store.) Discuss how this knowledge can help plan shopping trips to consume more whole foods and fewer refined foods.

5. Have students research and write about the origin of selected fruits and vegetables and how these influence the culture of that area, nutritional deficiencies that may have been issues and how the climate of that area influenced whether the foods eaten were annuals, biennials, and perennials.
6. USDA has a Fruit and Vegetable Challenge Activity kit that encourages students to try healthy fruits and vegetables at www.fns.usda.gov/tn/fruit-vegetable-challenge-packet.

Resources:

The University of Florida Extension
www.edis.ifas.ufl.edu/topic_vegetables_by_type

Wayne's World
www.waynesword.palomar.edu/ww0601.htm#oldest

Credits:

The Gymnosperm Database
www.conifers.org/topics/oldest.htm



1, 2, 3 Infinity?

Sample Pre-Post Assessment

1. What is an annual? Give an example:
2. What is a biennial? Give an example:
3. What is a perennial? Give an example:
4. Why and where do plants store food?
5. How does the plant's food storage affect the nutrients of that food?

Annual, Biennial or Perennial

Leaves	Bulbs	Stems		Roots	Fruits			Flowers	
		Stems	Tubers		Fruit	Leaves	Seeds		Nuts
Lettuce (A)	Onions (B)	Asparagus (P)	Potatoes (A & P)	Carrots (B)	Apples (P)	Lima beans (A)	Walnuts (P)	Sugar pea pods (A)	Cauliflower (A)
Cabbage (B)	Garlic (B)	Sugarcane (P)	Water chestnuts (P)	Beets (B)	Oranges (P)	Peas (A)	Peanuts *** (A)	Green beans (A)	Broccoli (A)
Celery (B)	Scallion (B)	Bamboo shoots (P)	Jicama (A & P)	Sugar beet (B)	Banana (P)	Sweet corn (A)	Pistachios (P)		Artichokes (P)
Spinach (A)			Jerusalem Artichokes (P)	Radish (B)	Mangos (P)	Spring wheat (A)	Pecans (P)		
Parsley (B)				Sweet potato (B) (Yam)**	Kiwi fruit (P)	Winter wheat (B)	Coconuts (P)		
Endive (B)					Grapes (P)	Oats (A)	Cashews (P)		
Tea (P)					Avocado (P)				

*Most people believe that celery is a plant stem or stalk. Not, so. The stalk of celery is actually a leaf petiole and not the plant stem. If a celery bunch is dismantled, the actual plant stem can be seen inside the center of the base. Rhubarb is also a leaf petiole.

**What we call a yam is actually a sweet potato. True yams come from Africa and are a much larger vegetable.

***Peanuts are not true nuts; they are legumes that grow as annuals.

1, 2, 3 Infinity? Quiz

Name _____

1. Complete the chart: (2 points for each answer)

	Raw Food Harvested	Part of the Plant We Harvest	Two Nutrients We Get
Annual			
Annual			
Annual			
Biennial			
Biennial			
Biennial			
Perennial			
Perennial			

2. Define annual, biennial and perennial on the back of the page. (10 points each)

3. Explain in one paragraph why it is important to eat a variety of fruits and vegetables. (6 points)

1, 2, 3, Infinity? Quiz

Name _____ *Answer Key* _____

1. Complete the chart: (2 points for each answer)

	Raw Food Harvested	Part of the Plant We Harvest	Two Nutrients We Get
Annual	Lettuce	Leaves	Vitamins, Minerals
Annual	Watermelon	Fruit	Sugar, Minerals
Annual	Tomato	Fruit	Vitamins, Carbohydrates
Biennial	Winter Wheat	Fruit (Seed)	Oils, Protein
Biennial	Carrots	Root	Carbohydrates, Vitamins
Biennial	Sweet Potato (Yam)	Root	Carbohydrates, Vitamins
Perennial	Orange	Fruit	Vitamins, Sugar
Perennial	Asparagus	Stem	Vitamins, Minerals

2. An annual is a plant that lives its whole life cycle in one year. A biennial is a plant that lives its whole life cycle in two years. A perennial is a plant that lives for many years and completes its life cycle over many years

3. The essay should contain that fruits and vegetables all contain different nutrients. To obtain all of the nutrients needed a variety must be consumed. If you eat only a few fruits and vegetables or none at all you will be at risk of having a diet that is deficient in nutrients and may put your health at risk. For added credit, if students identify that consuming too much of some nutrients can also harm health or lead to weight gain give the students extra points