

A vibrant blue background featuring various science-related icons: a dropper, a magnifying glass over a cell diagram, a yellow pencil, a calculator, a ruler, and a clipboard with lined paper.

SCIENCE

Student Book

► **4th Grade | Unit 1**

.....

SCIENCE 401

PLANTS

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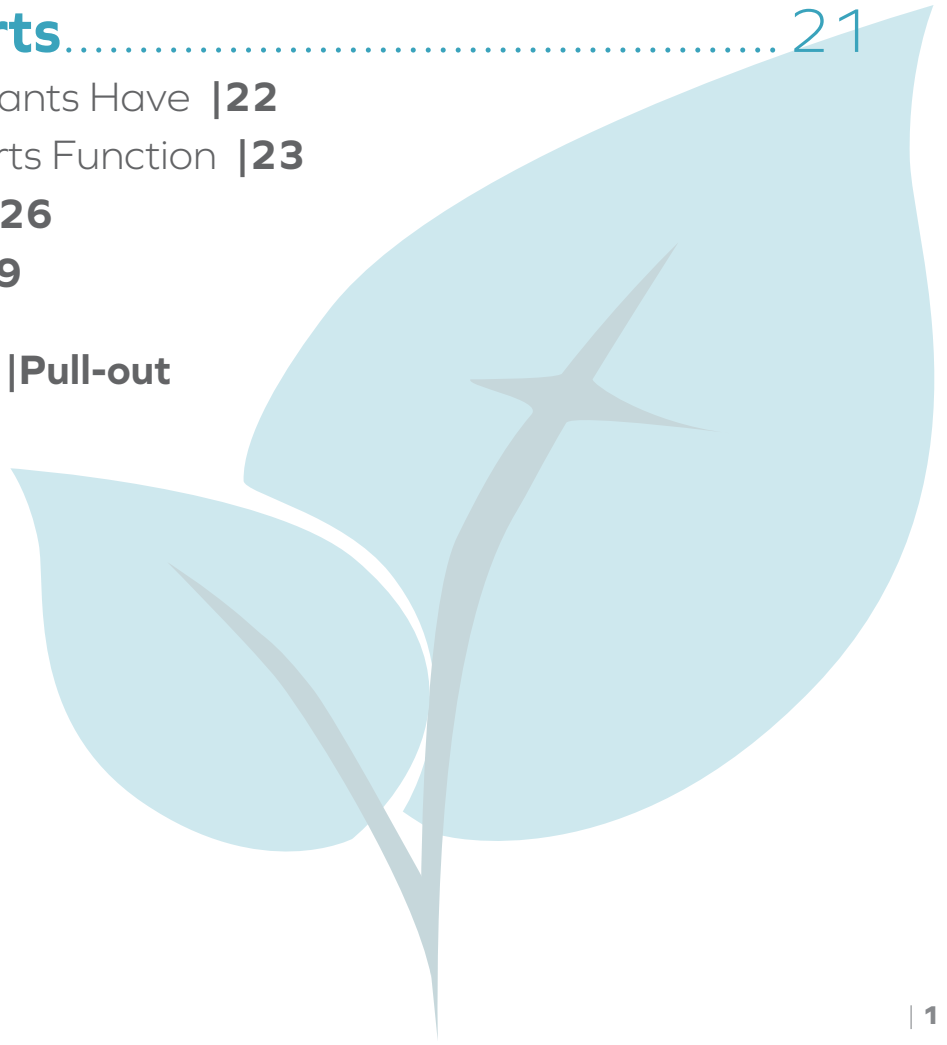
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PLANTS

In this LIFEPAK® you will learn more about God's world. You will be better able to see and tell about God's design in nature and know that God has created a beautiful world for us to enjoy. You will learn about plant life and the parts of plants. You will learn to appreciate God's wonderful creation.

Objectives

Read these objectives. The objectives tell you what you will be able to do when you have successfully completed this LIFEPAK. Each section will list according to the numbers below what objectives will be met in that section. When you have finished this LIFEPAK, you should be able to:

1. Tell why plants are living things.
2. Explain how some plants are used.
3. Tell about the different parts of a plant.
4. Explain how the different parts of the plant work together.

Science 400 Supplies

Many of the things that you will need to perform the experiments in Science 400 can be found around the home. For instance, instead of using test tubes, you may substitute baby food jars and lids. Instead of a beaker, you may use a mayonnaise jar. Some of the things you will need to successfully perform the experiments you will just need to borrow or buy. There are resources in your area where you may be able to find these materials. Your local school may lend you a microscope or perhaps you can buy an older one from them when they purchase new ones. There may be major discount department stores in your area that sell these things for low cost. Ordering science material through the mail or over the Internet is also a possibility. With each complete boxed set of science curriculum, you should receive an order blank from a trusted supplier for science supplies in the sizes and amounts that you will need to successfully perform the experiments.

If you did not receive an order blank, call the Alpha Omega Publications Customer Services Department for more information.

A suggested support item for this course is the 4th Grade Science Experiments video, SD0401. The video includes presentations of many of the experiments in this course. Several of the experiments that require special equipment or materials are demonstrated on these videos. They can either be used for answering the questions of the lab report or as a demonstration of the procedure prior to performing the experiment. A notice is included with each experiment in the LIFEPAK where the video is available.

Remember, it is the supervisors' or parents' responsibility to make sure that all students follow proper safety procedures for experiments and lab work. Any questions that you have about chemicals or supplies should be directed to the supplier of those materials. It cannot be assumed that all necessary warnings and precautions are contained in this material.



As a Christian school curriculum publisher, we discuss what is taught and believed regarding the creation and origins of life on our planet from the Christian point of view. It is the responsibility of the family to decide what they desire to be learned by their students in the school and the home, and whether or not the biblical view is what they want to be taught. There are a number of Christian websites on the Internet, however, that may be examined to get further information on the origins of life from a biblical point of view. One of them is the Creation Research Institute website.

1. PLANT LIFE

In this part of your LIFEPAK you will learn about living plants: why plants are living and how plants are used.

Objectives

Review these objectives. When you have completed this section, you should be able to:

1. Tell why plants are living things.
2. Explain how some plants are used.

Vocabulary

Study these new words. Learning the meanings of these words is a good study habit and will improve your understanding of this LIFEPAK.

appreciate (u prē shē āt): To be thankful. To know the value of something.

asparagus (u spar u gus): A spring vegetable. The tender young shoots are eaten.

beet (bēt): The root of a plant, usually eaten as a vegetable.

citrus (sit rus): Fruit such as oranges or lemons.

created (krē āt id): Made

grapefruit (grāp früt) A yellow, round citrus fruit larger than an orange.

herb (ərb) A plant whose stems or leaves are used in cooking.

lettuce (let is) The green leaves of a plant used in salads.

parsnip (pär snip): A vegetable with long, white root like a carrot.

pepo (pē pō): A fleshy fruit with a hard rind and many seeds, such as a melon or cucumber.

pome (pōm): Fruit such as pears, apples, or quince.

quince (kwins): A hard, yellow sour fruit.

radish (rad ish): A small root with red or white skin.

reproduce (rē pru dūs): To make again.

spinach (spin ich): A plant with green leaves which are eaten raw or boiled.

storehouse (stôr hous): A place where things are kept.

turnip (tèr nup): A plant with large roots used as a vegetable.

universe (yü nu vèrs): Everything there is.

vitamins (vī tu munz): Substances in food that are needed for growth.

yam (yam): Root of a vine used for food. A sweet potato.

Note: All vocabulary words in this LIFEPAK appear in **boldface** print the first time they are used. If you are unsure of the meaning when you are reading, study the definitions given.

Pronunciation Key: hat, āge, cāre, fār; let, ēqual, tèrm; it, īce; hot, ōpen, ôrder; oil; out; cup, pūt, rüle; child; long; thin; /TH/ for then; /zh/ for measure; /u/ or /ə/ represents /a/ in about, /e/ in taken, /i/ in pencil, /o/ in lemon, and /u/ in circus.

Why Plants are Living Things

Plants were created by God as living things. God made them and gave them life. God made things that have life go through stages of growth. Plants have life from God, and they grow. God has also provided everything plants need in order to grow.

Plants have life. Did you ever have a garden and watch a tiny sprout stick its head up through the soil? Or perhaps you have watched a plant poke its stem and leaf up through the soil in a flowerpot near a window. Did you understand why the little plant came up? Isn't it exciting to know that a mysterious law of life, created by God, was at work before your very eyes? We know that life is one of the great mysteries of the **universe**, and we can usually recognize whether a thing is living or not. For instance, you know that a dog is a living thing and that a rock does not have life. You know that living things grow, **reproduce** themselves, and need food, air, and water to live. They are also different from nonliving things in the way the matter that makes them up is put together.

Plants grow. When you looked outside or came to school this morning, did you see any plants? I hope you did. Plants grow almost everywhere in the world around us—even beside city streets. Many different kinds grow in all sizes and shapes. Some plants, such as violets, may be very small. Others, such as trees, are sometimes very large. You already know that living things need air, light, water, and food to live and grow. God gave us everything we need to grow. He gave plants and animals everything they need to grow, too. You also know that God **created** nonliving objects such as rocks, sky, stars, moon, and sun.

The following exercise contains some words that name living things. The list also has some words that name nonliving things.



Put the right letters after each word. For each word that names a living thing, write the letter L in the blank space. For each word that names a nonliving thing, place the letters NL in the blank.

1.1 _____ stone

1.2 _____ sand

1.3 _____ tree

1.4 _____ baby

1.5 _____ auto

1.6 _____ canoe

1.7 _____ factory

1.8 _____ apple tree

1.9 _____ water

1.10 _____ insect

As you think about this list you will remember that all living things breathe air and need water, food, and light. You know, too, that such nonliving things as sand, stones, and water are part of the earth. Other things, such as automobiles and canoes, are man-made objects.

When God made the earth, He created both living and nonliving things. We can read about them in His Word, the Bible. In the very first book of the Bible (Genesis 1:11), we read about plants. God said, "Let the earth bring forth grass [plants], the **herb** yielding seed [plants with seeds], and the fruit tree yielding fruit ... upon the earth: and it was so." In the last book of the Bible (Revelation 4:11), we are told that God created *all* things: "Thou art [are] worthy, O Lord, to receive glory and honour and power: for thou hast created all things, and for thy pleasure they are and were created." How great God is to plan and create all things that we need to stay alive and to enjoy the living and nonliving things around us.



Learn this verse from the Bible.

1.11 When you have learned this verse, say the verse to your teacher.



Teacher check:

Initials _____

Date _____

“Thou art worthy, O Lord, to receive glory and honor and power: for thou has created all things, and for thy pleasure they are and were created.”

Revelation 4:11

How Plants are Used

God made plants for our use. Among the many ways plants are used, four uses of plants will be discussed in this section. Plants are used for food, for shelter, for enjoyment (of their beauty), and for state symbols.

For food. In the following story about Rick and Mary’s visit with their Uncle George, you will learn with them how plants are used for food.



Rick and Mary came dashing into the house.

“Have you heard the news?” Rick asked.

Mother glanced up from the counter where she was working.

“What’s happened?” she asked, smiling at the children.

Rick began to explain. "School is going to be out two days earlier than planned. We'll have more days for Easter vacation. There's a teachers' meeting. The teachers have to go to school instead of us, so we can go visit uncle George and..."

"Wait a minuted. Not so fast," Mother said. "I thought we were all going to the mountains for our vacation."

"That's right." Rick replied. "Now we will be able to visit Uncle George and Aunt Martha and still go to the mountains with you and Dad."

"Alright," Mother agreed. "If your Father says yes, you may go."

"Hurrah!" Rick and Mary shouted, almost together. "We'll ask Father tonight."

As soon as Dad got home, the children approached him. Their question was soon answered.

"Yes, you may go," he told them. "I will take you tomorrow after school is out."

The next day, two happy children were on their way to visit their uncle and aunt.

On the way Rick asked, "Dad, do you think Uncle George will help us with our homework on plants?"

"Probably," Dad answered. "He is a biologist, you know, and they have a large garden."

The children chatted all the way to Richford. When their father waved good-bye, they were already busy asking questions about what Aunt Martha had planned for dinner.

When Uncle George came home from work, Rick and Mary were pleased to see what a tasty dinner Aunt Martha had ready for them.

"The sweet potatoes and boiled white potatoes are really good," Mary began. "And I think the **asparagus** is cooked right."

"Thank you." Aunt Martha said, smiling a little. "They are very fresh, right out of the garden, as all of our vegetables are."

"We've been learning about plants in school lately," Rick said. "Uncle George, won't you tell us about potatoes and asparagus?"

"Well, Uncle George replied, "although white potatoes, sweet potatoes, and asparagus are all called vegetables, they are not all the same parts of a plant. We often think of white potato as a root because it grows below the ground. But although it looks like a root and it does grow below the ground, it is really a stem."

"Is that true?" Mary asked.

"Yes, that is right," her uncle replied. "I have heard that many years ago, when people started raising potatoes in Germany, they didn't know what part of the plant to eat. First they ate the seedball, but it tasted so bad they almost stopped raising potatoes. They learned they were supposed to eat the stems instead, and potatoes became an important food for them."

"Was Germany the first country to find out about the potato?" Mary asked.

"No," Aunt Martha answered. The first potatoes were grown in South America. More than four hundred years ago the Indians of Peru and Bolivia found out how to grow potatoes."

"How about sweet potatoes?" Rick asked. "Aren't they a part of the stem?"

"No," Uncle George laughed. "Sweet potatoes, carrots, **turnips**, and **beets** are all root vegetables. Their roots are **storehouses** for food. So are **radishes**, **parsnips**, and **yams**."

"What about the **lettuce** we had in our salad?" Mary asked.

"When we eat lettuce, we are eating the leaves of the plant," Aunt Martha pointed out. "The leaves we had tonight are smooth ones. Some lettuce leaves are curly. If you look at the different kinds of lettuce the next time you go to the market, you will notice that some leaves are loose and others are crowded close together into a head. **Spinach** and cabbage are also called leafy vegetables."

"What about onions?" Mary asked. Aunt Martha continued. "The part of the onion that we eat is a bulb. It is made of leaves that overlap one another. Because the onion grows underground, it doesn't have the same color that other vegetables have. The sunlight makes the difference."

"I didn't know there were so many different kinds of vegetables," Rick laughed. "What about the corn and peas we had yesterday at home?"

"They store their food in the seeds," replied Uncle George. "Beans, too, are vegetables which we eat fresh from the garden or canned or frozen. You remember from your history, corn was a very important food for the American Indians and the pioneers."

By this time, the children were wondering what they were going to have for dessert. They didn't have long to wait. Aunt Martha was bringing out a huge bowl of fruit: apples, oranges, berries, grapes, and pears.

"Help yourself to as many different kinds as you wish," Aunt Martha said.

The choice was hard to make. The fruit all looked so good. Finally Rick took an apple and

a bunch of grapes. Mary chose an orange and a pear.

"A good diet calls for some fresh fruit every day," Aunt Martha told them. "The chief food stored in fruit is sugar. Sugar gives us energy to run, to play, and to work. **Citrus** fruit, such as oranges and **grapefruit**, are a good source of **vitamin C**; and prunes have vitamin A."

"The apple you are eating, Rick, is a fruit that scientists call a **pome**," Uncle George pointed out. "The seeds are in the center of the fruit. Pears and **quinces** are pomes, also. Some fruits are called **pepos**. They are large fruits with thick rinds. They also have many seeds inside them. Pumpkins, melons, and squash are pepos."

By this time, Rick and Mary were wishing they could stay at the table and talk longer, but just then Aunt Martha suggested that they wash and dry the dishes, and the children knew that the talk about plants was about over.

"I think we have had a wonderful meal and also learned some new things about food and plants," Rick said, as they were starting to the kitchen to help their aunt.

"I think so, too," Mary agreed, joining her brother.

"That's right," replied Uncle George. "And there's much more to learn, but we will have to wait until some other time. Perhaps tomorrow we can learn about some interesting kinds of fruit that are shipped to us from other places in the world."



Choose the correct answer. One of the following titles best fits the story you have just read. Put a check before the title which you think is the best title for the story. Remember that the title should tell you the main idea of the story.

- 1.12** _____ RICK AND MARY TAKE A TRIP
- 1.13** _____ RICK AND MARY LEARN ABOUT FOOD
- 1.14** _____ RICK AND MARY HAD FRUIT FOR DESSERT



Complete these statements. Use the words below.

root	stem	food
living	bulb	

- 1.15 When God created the earth, He created both _____ and nonliving things.
- 1.16 The white potato which Rick and Mary had for dinner was the _____ of the potato plant.
- 1.17 The part of the onion which is eaten is the _____.
- 1.18 Sweet potatoes, beets, turnips, and carrots are all _____ vegetables.
- 1.19 The roots of carrots and beets are storehouses for _____.



Choose the correct ending for each sentence by writing the correct letter (a, b, c, d, e) after each number below.

- 1.20 _____ Lettuce, spinach and cabbage are
 - a. citrus fruit.
 - b. which scientists call pomes.
- 1.21 _____ A good diet calls for
 - c. some fruit every day.
- 1.22 _____ Oranges and grapefruit are called
 - d. vitamin C.
- 1.23 _____ Apples are fruit
 - e. leafy vegetables.
- 1.24 _____ Citrus fruits are a source of



Read about fruits from other countries. In a reference book in the library or from sources online, find the names of four fruits that come from countries other than the United States. If you need help, ask the librarian or your teacher to help you. Write the names of the fruits and the countries in the following blanks.

	Name of fruit	Name of country
1.25	_____	_____
1.26	_____	_____
1.27	_____	_____
1.28	_____	_____



Write a paragraph. In a paragraph write a short story about one of the fruits you found out about and about the country from which it came. Remember to use capital letters for the beginning of each sentence. Write your story on the following lines.

1.29



Fruit Hunt. Solve this puzzle by changing the letters around to spell the name of a fruit. Example: reap – pear

1.30	regap	_____
1.31	lapep	_____
1.32	rebry	_____
1.33	talunw	_____
1.34	rhryec	_____
1.35	ganreo	_____
1.36	nemol	_____



Something to do at home. Have you ever eaten a candle salad? You can make some at home very easily. First, get permission from a parent.

For a candle salad you will need the following items (one of each item for *each* salad):

These things are needed:

- Piece of lettuce
- Slice of canned pineapple
- one half of a banana
- a cherry
- a salad plate
- a teaspoon of mayonnaise
- a toothpick



Teacher check:

Initials _____ Date _____

Follow these directions. Check the box as you do each step.

- ☐ 1. From a head of lettuce, select a crisp leaf for each salad.
- ☐ 2. Wash the leaf well, pat it dry, and put one leaf on each plate.
- ☐ 3. Place a slice of pineapple on the lettuce leaf.
- ☐ 4. Place a half banana (peeled) into the hole of the pineapple ring.
- ☐ 5. Use a toothpick to put the cherry on top of the banana.
- ☐ 6. For a handle you may wish to use a round "Life-Saver" candy or perhaps a teaspoonful of mayonnaise.

Now you have finished the salads. They should all look like candles. If you are having guests for dinner and they ask about the salads or say something nice about them, they will give you a chance to say something about Jesus. You might tell them that Jesus said He was the light of the world while He was on earth. He is our light. As Christians, we are the light of the world. You might even call your salad "The-Light-of-the-World" salad instead of a candle salad.

For shelter. Many years ago a poet by the name of Joyce Kilmer wrote a poem about a tree. In the last lines of his poem, he wrote these words:

“Poems are made by fools like me, But only God can make a tree.”

These words teach us a very good lesson, don’t they? Our great God made trees (as well as all other plants) for our use.

For hundreds and hundreds of years, man has used the bark, the leaves, and the wood of trees from the forests to make shelter for himself.

On your way home this afternoon or when you are traveling with your parents, keep watch to see how many different ways wood is used. If possible, visit a place where new buildings are being built. (Caution: Do not go alone or go where men are working. Ask someone older to go with you and be sure to ask your parents for permission.) Notice how much wood you can see. For what different parts of the building will the wood be used?



We Plant a Seed

We plant a seed, a tree to grow,
It sends its roots so deep below.

It lifts its head to God above,
As God has said, “I’ll send my love.

I’ll give you rest beneath my tree,
And birds shall nest and sing to thee.”

So thank our Maker in heaven above,
And rest secure in His great love.

For enjoyment. Besides giving us shelter, plants are useful in many other ways. They also give us *enjoyment*. Perhaps you have walked along a country road or gone to a city park where many trees and flowers were. Can you imagine what that countryside or that park would be like without any trees or flowers? When you are too tired to play any more, isn’t it delightful to lie down in the shade of a beautiful tree and watch the clouds go by? Or, perhaps you have wandered in the park or stopped to pick a wildflower beside the country road.

When God created the world, He knew we would enjoy the beauty of it. He created the flowers in a rainbow of colors – red and blue, yellow and white, purple and pink, and many shades in between. Then He gave us the green of the leaves and the grass to make a perfect background for the flowers.

For state symbols. In 1891, the state of New York became the first state to select a flower. The school children of the state selected the rose. Since that time, every state in our country has selected some flower for its symbol.



Make a list of what you see that is made of wood.

- 1.37** Look around your school or home (inside and outside). Make a list of all the things you can see that are made of wood. Share your list with a classmate or with your teacher.



Teacher check:

Initials _____ Date _____

- 1.38** Look around your house tonight. Make a list of all the things you can find that are made of wood. Bring the list to class and compare it with several classmates. Share with them and ask them to share with you to make a longer list.



Teacher check:

Initials _____ Date _____



Answer these questions.

1.39 What are the four ways, discussed in this section, that plants are used?

- a. _____
- b. _____
- c. _____
- d. _____

1.40 Citrus fruit is a good source of what? _____

1.41 What plant is used to make new buildings? _____

1.42 Where do carrots and turnips store food? _____



Research about flowers. Find and make a list of all the flowers that are used as symbols for the states. You can use a reference book, like an encyclopedia, or online resources to find this information. Some flowers will be used by more than one state. If you have difficulty, your librarian or teacher will help you.

1.43 Share your list with a classmate or with your teacher.

Place a check () here when you have shared.

1.44 What is the flower for the state where you live? _____

1.45 What is the flower for Alaska? _____

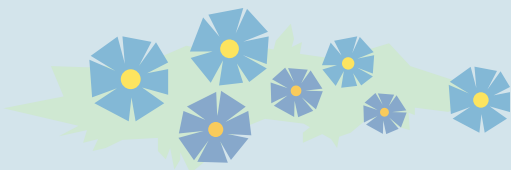
1.46 For Hawaii? _____



Write a sentence or two to tell why you think God created a world with so much beauty in it.

1.47 _____

Here is a poem you may enjoy reading.



THE LEGEND
OF THE
FORGET-ME-NOT

When to the flowers so beautiful
The Father gave a name,
There came a little blue-eyed one
All timidly it came
And standing at the Father's feet,
And gazing at His face,
It said with low and timid voice,
And yet with gentle grace,
"Dear Lord, the name Thou gavest me,
Alas, I have forgot."
The Father kindly looked on him
And said, "Forget-me-not."



Do these activities.

- 1.48 What state chose the forget-me-not for its state flower?

- 1.49 Select *one* flower from your list of state flowers and write a short paragraph about it below. You may want to tell why you think God loves flowers so much.



Review the material in this section to prepare for the Self Test. The Self Test will check your understanding of this section. Any items you miss on this test will show you what areas you will need to restudy in order to prepare for the unit test.

SELF TEST 1

Each answer = 4 points

Write in the word from the list below that best finishes the sentence.

bulb	corn	energy	grow
pepos	pomes	South America	sugar
vegetable	water		

- 1.01** Living things need food, air, and _____ to live.
- 1.02** God has given us everything we need to _____.
- 1.03** The onion plant stores food in its _____.
- 1.04** One of the chief foods stored in fruit is _____.
- 1.05** Melons, squash, and pumpkins are called _____.
- 1.06** Sugar gives us _____.
- 1.07** Scientists call apples _____.
- 1.08** Asparagus is a _____.
- 1.09** The American Indians and the pioneers used the seeds of the _____ plant for food.
- 1.010** The first potatoes were grown in _____.

Choose the right word. Write the letter and word on each line that makes the sentence correct.

- 1.011** The roots of beets and carrots are storehouses for _____.
 a. bulbs b. fruit c. food
- 1.012** The pea plant stores food in the _____.
 a. seeds b. blossom c. ground
- 1.013** A fruit which has vitamin A is the _____.
 a. bean b. corn c. prune

1.014 Cabbage and spinach are _____ vegetables.
a. citrus b. South American c. leafy

1.015 An example of a nonliving thing is a _____.
a. plant b. bicycle c. cow

1.016 Name two ways in which plants are used.
a. _____ b. _____

Match these items by writing the correct letter in the blank.

1.017	_____ created	a. salad
1.018	_____ lettuce	b. vegetable seed
1.019	_____ citrus	c. made
1.020	_____ bean	d. nonliving
1.021	_____ boat	e. fruit

Place the letter which shows the correct answer in the blank below.

1.022 Apples are _____.
a. pepos b. pomes c. vegetables d. none of these

1.023 The pioneers in America used the _____ corn for food.
a. stalk b. root c. seed d. none of these

1.024 The onion plant stores food in its _____.
a. stem b. bulb c. root d. none of these



Teacher check:

Score _____

Initials _____

Date _____

