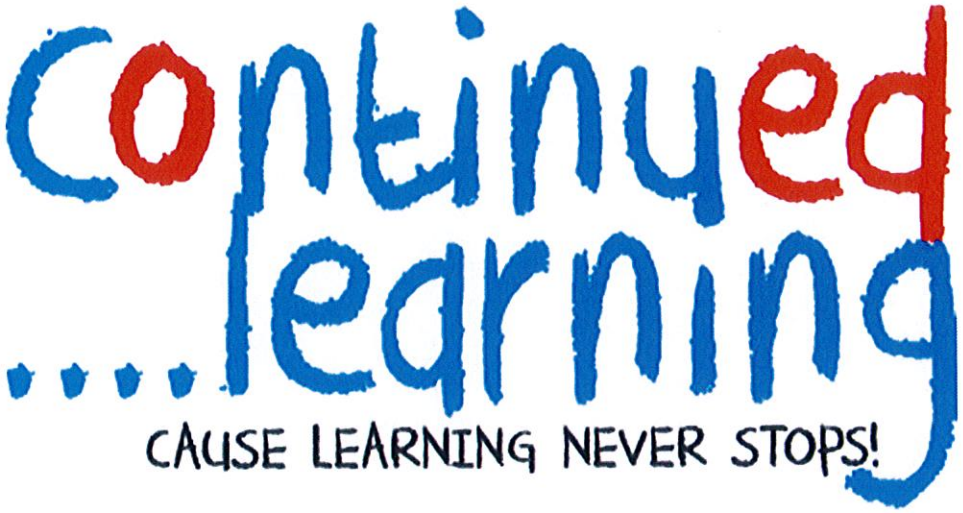
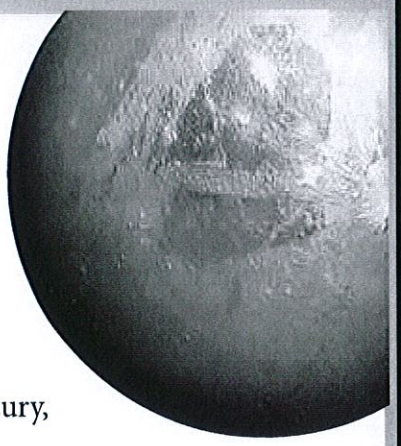
A.W. James Elementary School



5th Grade ELA, Math, & Science Week 1

Student Name _____



How Pluto Stopped Being a Planet

by Tyrone Nielson

1 For decades, people believed our solar system had nine planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, and Pluto. But in 2006, a group of astronomers decided that Pluto was not a true planet but something else: a dwarf planet.

2 The term "dwarf planet" might make you think that Pluto was kicked out of the planet club solely because of its size. And it's true that Pluto is small compared with the planets. If Earth were the size of a basketball, Pluto would be the size of a golf ball. But Pluto's size isn't why most astronomers now call it a dwarf planet. So why the change to Pluto's status?

3 Here's why. In August 2006, astronomers came up with a new definition of *planet*. To be a planet, they said, an object has to meet three conditions.

- It has to orbit the Sun directly. It can't be a moon orbiting a planet.
- It has to be massive enough for its own gravity to pull it into the shape of a ball.
- It has to have cleared its neighborhood of smaller objects around its orbit. In other words, during its trips around the Sun, a planet must draw smaller objects into itself, or pull them into its orbit, or fling them off into space.

4 Pluto does not meet the third condition. It hasn't cleared its neighborhood the way the planets have. It moves within a field of rock-and-ice objects that it cannot clear away. That's why most astronomers now call Pluto a dwarf planet.

5 Not all astronomers accept the change to Pluto's status. Among other reasons, they feel that "clearing the neighborhood" isn't a well-defined concept. But most astronomers (and museums and textbooks and teachers) feel the new definition is clear enough to be useful. So long, Pluto—at least you're still with us as a dwarf planet.

Close Reader Habits

How does the article explain why astronomers reclassified Pluto? Reread the text. **Underline** key details explaining why the astronomers changed Pluto's status.

Think

Use what you learned from reading the science article to respond to the following questions.

Many science articles are about new discoveries or changes to old ideas. Like any informational text, a science article has one or more main ideas supported by key details.

1 This question has two parts. Answer Part A. Then answer Part B.

Part A

What is the main idea of the science article by Tyrone Nielson?

- **A** A group of astronomers decided that Pluto is a dwarf planet.
- **B** Pluto is large enough to be a moon but too small to be a planet.
- **C** Many astronomers are pleased that Pluto is not a planet anymore.
- **D** Some astronomers still believe Pluto should be called a planet.

Part B

Which statement from the text **best** supports the answer to Part A?

- **A** "For decades, people believed our solar system had nine planets. . . ."
- **B** "And it's true that Pluto is small compared with the planets."
- **C** "In August 2006, astronomers came up with a new definition of *planet*."
- **D** "It has to be massive enough for its own gravity to pull it into the shape of a ball."

2 Which of these is **most clearly** a key detail of the passage?

- **A** "And it's true that Pluto is small compared with the planets."
- **B** "If Earth were the size of a basketball, Pluto would be the size of a golf ball."
- **C** "It hasn't cleared its neighborhood the way the planets have."
- **D** "Not all astronomers accept the change to Pluto's status."

Talk

3 What is the main idea of paragraph 3? What key details support it? Use the organizer on page 17 to organize your information.

Write

4 **Short Response** Use the information in your organizer to explain how the key details you identified support the main idea of paragraph 3. Use the space provided on page 17 to write your answer.

HINT Don't just identify the key details. Also say how they support the main idea.

Read

Genre: Science Article

WORDS TO KNOW
As you read, look inside, around, and beyond these words to figure out what they mean.
- **observe**
- **inward**
- **reactions**

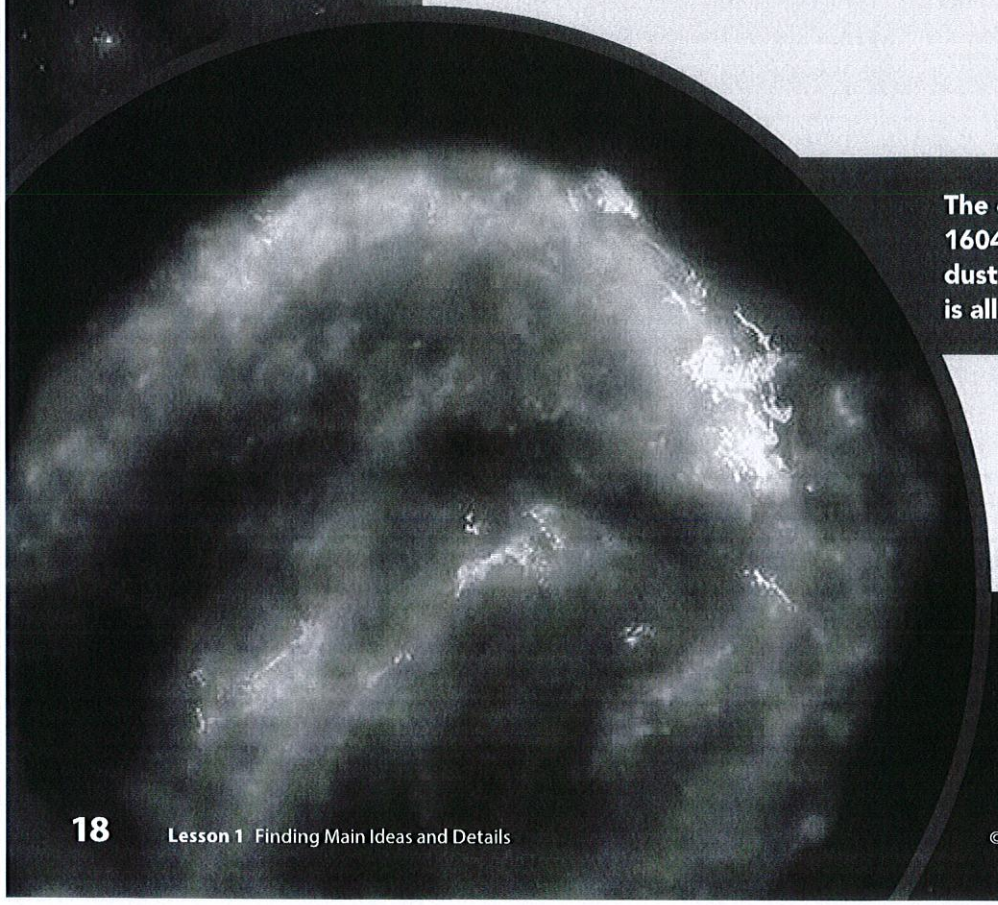
from When Stars EXPLODE

by Ken Croswell, PhD, *Highlights*

1 [A supernova is] the spectacular death of a star. The last time people saw a supernova in our galaxy was 1604. That was before astronomers were using telescopes. However, every year astronomers see supernovae exploding in other galaxies. Astronomers can often observe such supernovae for months before they fade from view.

2 Most supernovae—that's the plural of supernova and pronounced SOO-per-NOO-vee—come from massive stars. Antares is a massive star. Such a star is born with more than eight times the mass of the Sun.

3 When a massive star is young, it is hot, bright, and blue. Its center makes energy the same way the Sun does: by changing hydrogen, the lightest element, into helium, the second-lightest element. This nuclear reaction creates energy that heats the star and makes it shine.



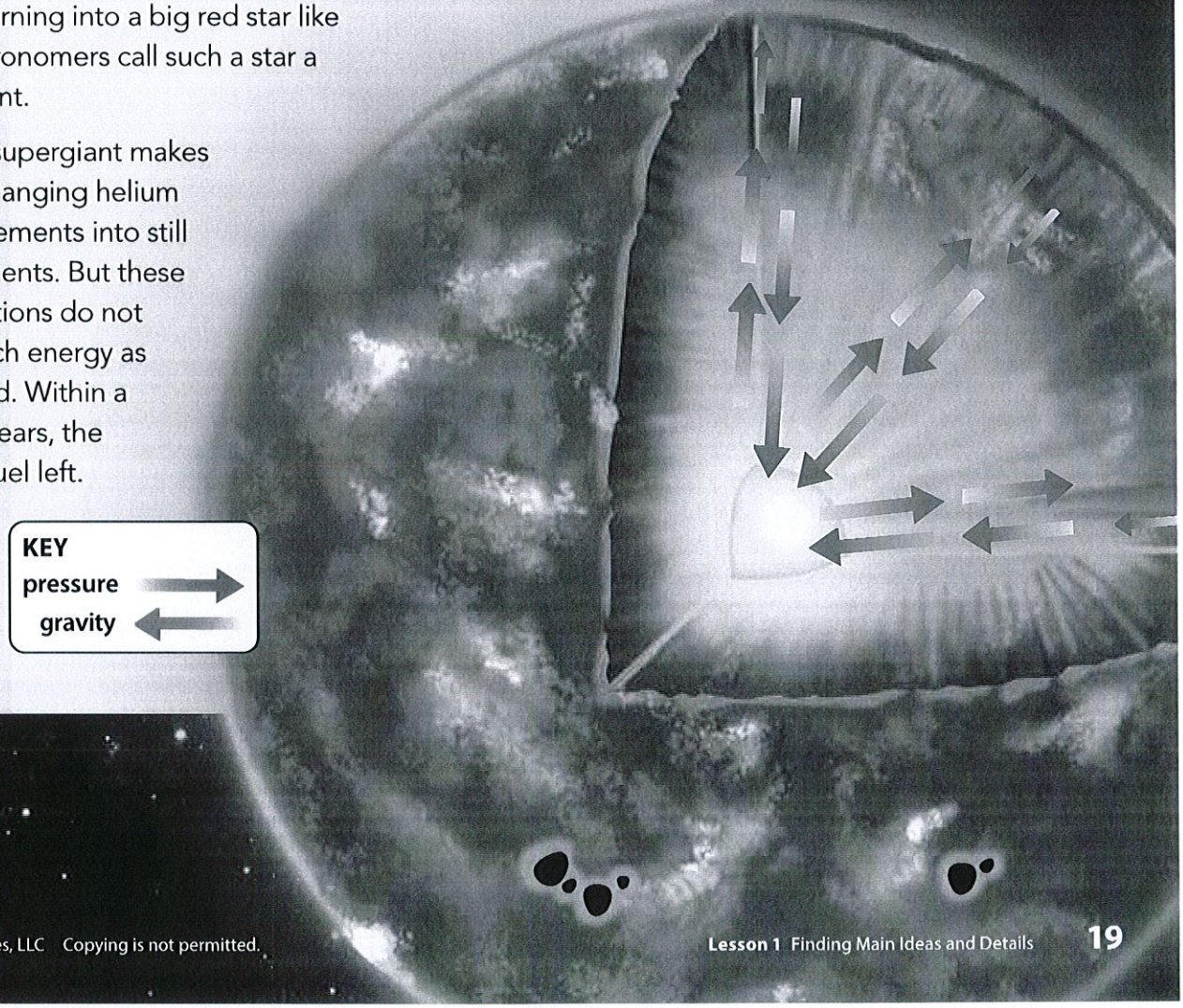
The exploding star that people saw in 1604 produced a glowing cloud of gas and dust called a *nebula*. The nebula at the left is all that remains of that star.

4 The outflow of huge amounts of energy—much of it light—pushes outward from the star's center. This is good, because the force of gravity pulls inward and tries to make the star collapse. But as long as the star can make energy, it can fight the force of gravity and survive.

5 However, a massive star must make lots of energy to fight the gravity of its own mass. So the star shines very brightly. As a result, we can easily see the star across hundreds of light-years of space. This is a huge distance, because one light-year is the distance that light speeds through in a year: nearly 6 trillion (6,000,000,000,000) miles.

6 But because the star shines so brightly, it uses up its hydrogen fuel within millions of years—much less time than the billions of years the Sun will take to use up its fuel. Soon the star's center runs out of hydrogen. Then the star expands and cools, turning into a big red star like Antares. Astronomers call such a star a red supergiant.

7 The red supergiant makes energy by changing helium and other elements into still heavier elements. But these nuclear reactions do not make as much energy as hydrogen did. Within a few million years, the star has no fuel left.



In a star, two opposing forces are always at work. Gravity pulls the star's mass toward its center. If no force worked against gravity, the star would collapse. But energy, in the form of heat and light, pushes out from the center and works against gravity. So long as the star can make energy to fight gravity, it stays alive.

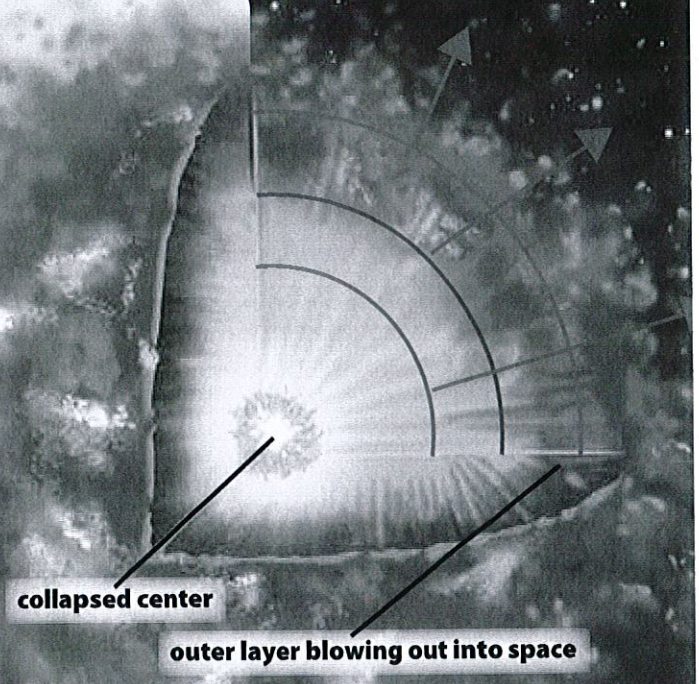
8 Now the star is in big trouble. The star can't make energy to hold itself up, and gravity is still trying to pull the star inward. So the star's center collapses, scrunching itself into a small, dense object. Meanwhile, the star's outer layer shoots into space at millions of miles per hour. The star has exploded!

Our Sun Won't Blow Up

9 Supernovae are violent, but we do not have to worry. The Sun will never explode. If a supernova occurred within a few dozen light-years of Earth, we would be in trouble. But the nearest star that will explode is more than a hundred light-years away.

10 Believe it or not, supernovae help life. In fact, without them, Earth would not exist. Neither would we.

11 Here's why. When the universe began, it had only the three lightest elements: hydrogen, helium, and a little lithium. But life needs heavier elements, such as oxygen, which we breathe, and iron, which is in our blood. And Earth is made mostly of oxygen, silicon, and iron. Almost all oxygen came from massive stars, like Antares. During their lives, massive stars cause helium nuclei to join together to make oxygen. Then, when the stars explode, they cast this oxygen into space. And the explosions themselves make iron. In fact, scientists think supernova explosions made most of the iron in the universe. . . .



A star needs fuel to make the energy that fights the pull of gravity. Once the star uses up its fuel, gravity wins the fight. The star's center collapses, and its outer layer blasts out into space. The star becomes a supernova.

Think Use what you learned from reading the science article to respond to the following questions.

1 This question has two parts. First, answer Part A. Then answer Part B.

Part A

What are **two** main ideas of the article by Ken Croswell?

- **A** Supernovae are violent explosions of stars.
- **B** Astronomers did not always use telescopes.
- **C** Astronomers can see supernovae for months.
- **D** Stars make energy through nuclear reactions.
- **E** Stars produce light that travels across the universe.
- **F** Supernovae are interesting for astronomers to study.

Part B

Which **two** sentences from the article **best** support the answer to Part A?

- **A** "The last time people saw a supernova in our galaxy was 1604."
- **B** "That was before astronomers were using telescopes."
- **C** "Such a star is born with more than eight times the mass of the Sun."
- **D** "Its center makes energy the same way the Sun does: by changing hydrogen, the lightest element, into helium, the second-lightest element."
- **E** "As a result, we can easily see the star across hundreds of light-years of space."
- **F** "If a supernova occurred within a few dozen light-years of Earth, we would be in trouble."

2 Read the following sentence from the text.

> But as long as the star can make energy, it can fight the force of gravity and survive.

Which dictionary entry **best** defines energy?

- **A** physical strength
- **B** hydrogen and helium gas
- **C** heavy metals that increase weight
- **D** power that comes from heat

3 In the chart below, only **two** sentences are actually main ideas of the article. Identify those main ideas. Copy them in the rows titled "Main Idea 1" and "Main Idea 2" in the charts at the bottom of the page.

Possible Main Ideas	
In 1604, a supernova exploded.	Antares is a massive star.
Supernovae make important elements.	Only some stars will become supernovae.
Astronomers did not always use telescopes.	Hydrogen is the lightest element.

Now study this chart. It contains supporting details from the article. Choose **one** detail that **best** supports **each** main idea you chose. In the charts at the bottom of the page, write each detail below the main idea it supports.

Possible Supporting Details	
"The last time people saw a supernova in our galaxy was 1604."	"And the explosions themselves produce iron."
"However, every year astronomers see supernovae exploding in other galaxies."	"The outflow of huge amounts of energy—much of it light—pushes outward from the star's center."
"The Sun will never explode."	"This nuclear reaction creates energy that heats the star and makes it shine."

Main Idea 1	
Supporting Detail	

Main Idea 2	
Supporting Detail	

Multiplying with the Standard Algorithm

Name: _____

The answers are mixed up at the bottom of the page. Cross out the answers as you complete the problems.

1 580 × 30

2 3,104 × 18

3 1,482 × 38

4 1,085 × 17

5 1,236 × 55

6 1,625 × 18

7 2,105 × 13

8 1,788 × 15

9 2,500 × 19

10 648 × 32

11 2,409 × 23

12 306 × 62

13 2,417 × 24

14 650 × 35

15 962 × 44

Answers

20,736	17,400	27,365	47,500	55,872
18,972	18,445	26,820	67,980	56,316
22,750	29,250	55,407	42,328	58,008

Multiplying Multi-Digit Whole Numbers

Name: _____

Estimate. Circle all the problems with products between 3,000 and 9,000. Then find the exact products of only the problems you circled.

1 132 × 34

2 247 × 15

3 145 × 23

4 308 × 12

5 158 × 41

6 364 × 32

7 400 × 29

8 254 × 17

9 187 × 42

10 216 × 12

11 323 × 18

12 194 × 26

13 317 × 14

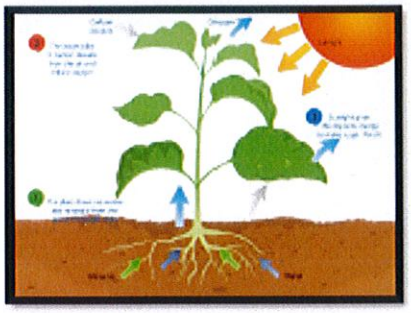
14 385 × 31

15 285 × 27

16 What strategies did you use to solve the problems? Explain.

PHOTOSYNTHESIS

Photosynthesis is how plants make their own food to eat! Photosynthesis is the process a plant uses to produce food and survive.



Plants need four things in order to do this:

1. Sunlight
2. Water
3. Carbon dioxide
4. Chlorophyll

Just like you, plants breathe in air. Carbon dioxide, Oxygen, and other chemicals are in the air. When plants breathe in they need carbon dioxide whereas when humans breathe in we need oxygen. You may have heard that talking to plants helps them grow. We'll it's true because plants need the carbon dioxide that we exhale and we need the oxygen that plants give off.

Plants also drink water. They need water, just like all living creatures, to survive. Since plants can not move around from place to place, they suck up water through their roots up to their stems and into their leaves.

Another key ingredient is sunlight! Photosynthesis takes place in the leaves of plants. A plant's green leaves are made up of tiny cells filled with chloroplasts. Each chloroplast contains a green chemical called chlorophyll which gives leaves their green color. Chlorophyll traps light energy from the sun, which is then used to combine carbon dioxide and water into sugar or food, for the plant. As you can see, chlorophyll is vital for photosynthesis because it helps plants get energy from light.

Oxygen is then exhaled back out into the air. This complete process is known as photosynthesis. This is why the rainforests are so important because they provide 20 to 30% of the Earth's oxygen supply. Humans depend on plants not only as a source of food but also for a large part of the oxygen in the air. Plants and trees help the Earth too by absorbing some of the greenhouses gases that hurt the atmosphere. The truth is, we need plants and trees as much as they need us!

What does a plant need to make its own food?

_____

_____

Name: _____Photosynthesis Cloze Passage - 

Photosynthesis is how _____ make their own _____! They need four things to do this: sunlight, water, chlorophyll, and carbon dioxide.

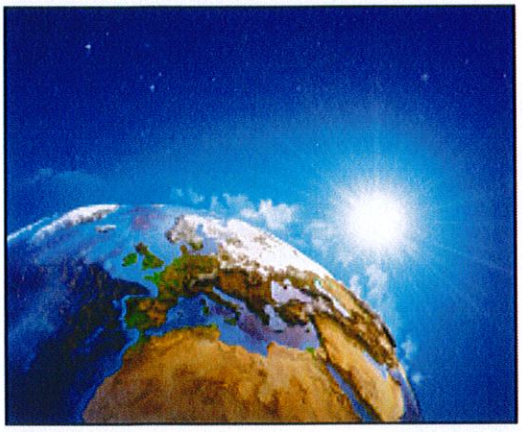
Just like you, plants breathe in _____. Carbon dioxide, Oxygen, and other chemicals are in the air. When plants breathe in they need _____ _____ whereas when humans breathe in we need oxygen. You may have heard that talking to plants helps them grow. We'll it's true because plants need the carbon dioxide that we exhale and we need the _____ that plants give off. Plants also drink _____. They need water, just like all living creatures, to survive. Since plants can not move around from place to place, they suck up water through their _____ into their stems and up into their leaves. Another key ingredient is _____. Photosynthesis takes place in the _____ of plants. A plant's green leaves are made up of tiny cells filled with _____. Each chloroplast contains a green chemical called chlorophyll which gives leaves their _____ color. Chlorophyll _____ light energy from the sun, which is then used to combine carbon dioxide and water into _____ or food, for the plant. As you can see, chlorophyll is vital for photosynthesis because it helps plants get energy from light. Oxygen is then _____ back out into the air. This complete process is known as _____. This is why the rainforests are so important because they provide more than _____ of the Earth's oxygen supply. Humans depend on plants not only as a source of food but also for a large part of the oxygen in the air. Plants and trees help the _____ too by absorbing some of the greenhouses gases that hurt the _____.

plants	roots	oxygen
carbon dioxide	exhaled	leaves
food	20%	chloroplasts
sunlight	water	photosynthesis
air	Earth	atmosphere
traps	green	sugar

THE SUN IS THE KEY!

Every organism needs to obtain energy in order to live. Plants, for example, get their energy from the sun. Some animals are herbivores and eat plants to get their energy. While other animals are carnivores, or meat-eaters, and get their energy from eating other animals.
Did you know that the sun is the beginning of all food chains? Why? Because all living things get their energy from the sun. This marks the start or base of every food chain.

Think about plants. Plants get their energy from sunlight. Plants use this amazing energy to turn water and carbon dioxide into food. This process is called photosynthesis. But plants also need nutrients. They get this from the soil when their roots gather up water. The nutrients and minerals in the soil allows the plant to grow and produce things like seeds, leaves, nuts, fruit, and vegetables.



Explain why the sun is the start of every food chain?

Where do people get their energy from?

Name_____

Photosynthesis

Photosynthesis: StudyJams
http://studyjams.scholastic.com/studyjams/jams/science/plants/photosynthesis.htm

Photosynthesis: _____

_____

- 4 Main ingredients in recipe for photosynthesis:

Water

Plants get water from either _____ or _____.

Plants use their _____ to drink the water up into its leaves

_____ throughout the leaves carry water to all of the plant cells.

Leaves

_____ are like human nostrils that allows the plants to breathe

What do guard cells do?

_____

_____

Chloroplast:

_____

_____

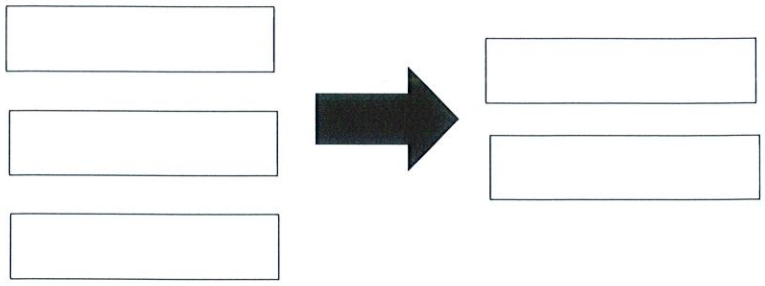
Plants use _____ to absorb sunlight.

Chlorophyll uses the sun's energy to cook the _____ and _____

When photosynthesis is complete, the plant has made _____ and _____

Name_____

Photosynthesis Process:



True or False: The oxygen made by plants is used by other living things

True or False: Plants get to eat spaghetti!

Close out of video and click on "Test Yourself".

Test Yourself Questions

1. Which ingredients are necessary for photosynthesis? _____
2. Which part of a plant works as its "nostrils" _____
3. Where does photosynthesis take place? _____
4. What part does chlorophyll place in photosynthesis?_____

   _____
5. What are water and carbon dioxide converted into by the end of photosynthesis?

   _____
6. Where do people and animals get the oxygen they breathe? _____
7. What do plants do with sugars? _____

Photosynthesis

Photosynthesis is the process through which plants use energy from sunlight to make sugars from carbon dioxide and water.

Plants Make their Food

All organisms need food to survive. Humans and animals, like the people and the dog in the picture, must take in food from the environment by *eating*.

The people and the dog must get their energy by eating food. Plants make their own food from sunlight.
Plants also need food to survive. Plants, though, do not eat food like humans do. Plants take in water, nutrients, and carbon dioxide gas and use these materials to make their own food with the help of *chloroplasts* that contain a green pigment called *chlorophyll*.

Chloroplasts & Chlorophyll

Plants contain small structures inside their cells called **chloroplasts**. Chloroplasts contain **chlorophyll**. Chlorophyll is a green *pigment* that absorbs some colors of light energy but reflects green light. The presence of chlorophyll is what makes most plant leaves look green to people. Plants and other organisms with chlorophyll make their own food through the process of **photosynthesis**.

The green color of most plants is caused by chlorophyll.

Photosynthesis

Photosynthesis is the process by which a plant makes particles of sugar to use as food. The materials a plant needs for photosynthesis include water, carbon dioxide, and energy from sunlight. The materials that photosynthesis produces are sugars and oxygen gas.

carbon dioxide + water + light ---- sugar + oxygen

Plants get water by absorbing it through their roots. They get carbon dioxide by taking it in through tiny holes in the plant's leaves and stems. Plants get energy from the Sun when sunlight falls onto the plant's leaves and is absorbed by chlorophyll in the leaves.

The light energy causes water particles to go through a chemical change to break apart into its components: hydrogen gas and oxygen gas. The hydrogen gas chemically combines with the carbon dioxide to make a particle of sugar that the plant can use as food. The plant does not need the oxygen gas for photosynthesis, so it releases the oxygen into the air. Plants can also use artificial light to make their food. The light from a light bulb also provides the energy the plant needs for photosynthesis. Many plants that grow under low-light conditions in nature grow very well inside with just artificial light.

House plants can grow well inside, even far away from windows. The light from light bulbs provides the energy for photosynthesis.