

Colonel NTI Packet

2024 – 2025

6th Grade

Day 11

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Language Arts	The Evolutionary Story of Peaches
Science	Week 5, Day 1 (Earth and Space Science)
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Name _____

Practice Test



6.RP.A.1

Understand ratio concepts and use ratio reasoning to solve problems.

1. Kendra has 4 necklaces, 7 bracelets, and 5 rings. Draw a model to show the ratio that compares rings to bracelets.

2. There are 3 girls and 2 boys taking swimming lessons. Write the ratio that compares the number of girls taking swimming lessons to the total number of students taking swimming lessons.

3. Luis adds 3 strawberries for every 2 blueberries in his fruit smoothie. Draw a model to show the ratio that compares the number of strawberries to the number of blueberries.

4. Sam has 3 green apples and 4 red apples. Select the ratios that compare the number of red apples to the total number of apples. Mark all that apply.

A 4 to 7

D 4 : 3

B 3 to 7

E $\frac{3}{7}$

C 4 : 7

F $\frac{4}{7}$

GO ON

Name _____

5. There are 3 girls and 4 boys taking music lessons. Write the ratio that compares the number of boys taking music lessons to the total number of students taking music lessons.

6. Camilla adds 2 cucumbers for every 5 tomatoes in a veggie mix. Draw a model to show the ratio comparing cucumbers to tomatoes.

7. Write the ratio 4 to 9 in two different ways.

8. Zena adds 4 cups of flour for every 3 cups of sugar in her recipe. Draw a model that compares cups of flour to cups of sugar.

9. Julia has 2 green reusable shopping bags and 5 purple reusable shopping bags. Select the ratios that compare the number of purple reusable shopping bags to the total number of reusable shopping bags. Mark all that apply.

A 5 to 7

D 5 : 2

B 5 : 7

E $\frac{2}{5}$

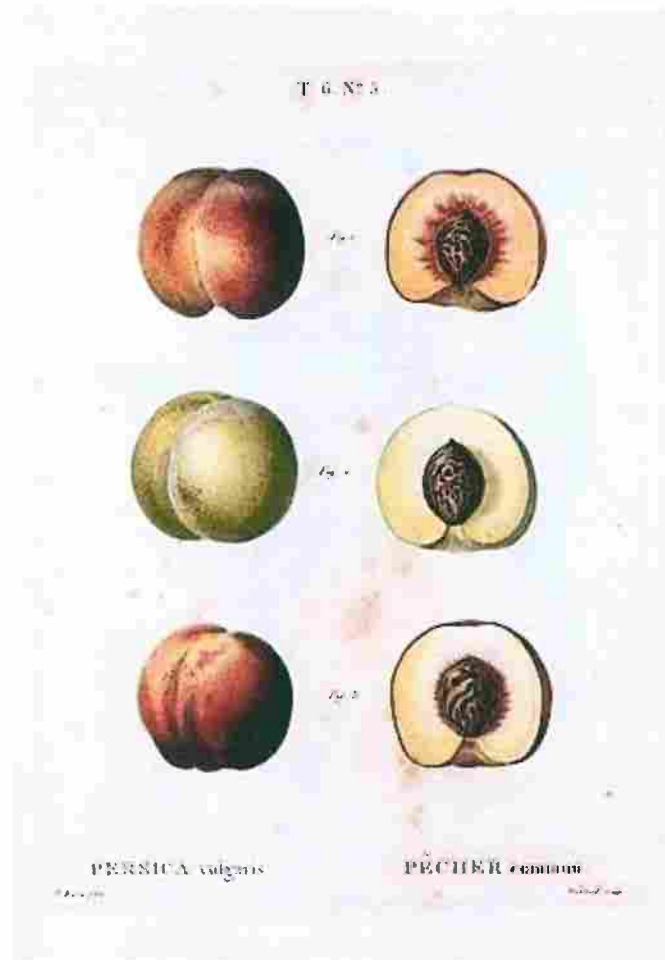
C 2 to 7

F $\frac{5}{7}$



The Evolutionary Story of Peaches

by Caitlyn Meagher



3 different varieties of peaches

M. Duhamel du Monceau, Pierre Joseph Redouté

Take a look around a grocery store. Do you see round red apples, juicy red tomatoes, and large orange peaches? You may think these fruits and vegetables have always looked and tasted like they do now. But that is not always the case! Many of the fruits and vegetables you can find in the grocery store have been designed to be a certain way through a process called artificial selection. Through this process, humans influence the way species reproduce to make sure certain traits are maintained or emphasized. This process provides a stark contrast to natural selection—the evolutionary process that occurs over thousands or millions of years, leading to gradual changes in species' traits. Let's explore these two different mechanisms.

Natural selection is the slow evolutionary process by which organisms adapt and change over time based on their environment. Since individuals in a species all have slightly different traits, some individuals have traits that are better suited to their environment. The individuals with these beneficial traits are more likely to survive and reproduce. They pass along these traits to their offspring. As a result, over time, these traits become more common throughout the species. This process causes species to change little by little over millions of years. Natural selection affects all living things. For

instance, many plant species bloom colorful flowers because of natural selection. Different pollinators, like bees and birds, are attracted to different flower colors. The colors that appeal the most to pollinators and the least to pests will more likely pass along their traits to future generations. The flower colors that do not attract pollinators may eventually die out. As such, many plants with colorful flowers you see in nature today are a result of millions of years of natural selection.

It is difficult to know exactly how most species have evolved over millions of years. However, recent findings have shed some light on how one particular fruit has evolved: peaches! Wild peach pits from more than 2.5 million years ago were recently discovered in China. These fossils were the first proof that peaches evolved through natural selection, long before humans arrived in this area. Ancient wild peach trees were better adapted to warmer, wetter climates than today's peach trees. And based on the size of the peach pits they found, researchers determined the fruit would have been about 2 inches wide. That's a tiny peach! Researchers believe that back then, peaches were a desirable food source for primates. These animals ate and spread the seeds of the wild fruit. The traits of the fruit that got eaten were the ones that were more often passed to future generations. At that time, there were probably only three peach varieties. This lack of variety illustrates how long it can take species to evolve naturally.

Peaches look quite different now. They are much larger and juicier than their wild ancestors. This is because peaches, like many other fruits and vegetables, have gone through the process of artificial selection. As part of this process, humans identify desirable traits in plants and animals. Then, they take steps to preserve and strengthen these traits in future generations of these species. For instance, if a farmer wants stronger stems on a plant to tolerate windy storms, they can find two plants with the strongest stems from the same species and cross-pollinate them. The plants that grow from this combination will also have stronger stems. Through artificial selection, farmers can change the traits of plant species over the course of just a few years. That's much quicker than natural selection!

Let's take another look at peaches. By 4000 B.C., Chinese farmers began planting peach seeds and growing peach trees. They selected seeds from the tastiest and largest fruits and cross-pollinated them. These farmers and the next generations of farmers repeated this process for thousands of years. After 6,000 years of artificial selection, the peaches produced by these trees were more than 16 times larger than wild peaches! They were also much juicier, sweeter, and more nutritious than their ancestors.

Today, farmers continue to test and grow over 200 different varieties of peaches. They see which ones are best adapted to specific environments. They also create varieties that can resist certain pests or that have a particular flavor that people enjoy. These improvements make them an even more delicious and nutritious snack!

Vocabulary

evolve

verb

definition: to develop, change, or improve by steps.

Some scientists believe that birds evolved from dinosaurs.

Spanish: desarrollar, evolucionar

preserve

verb

definition: When you preserve something, you protect it from being hurt or harmed, or you keep it from changing.

A lot of people in our town want to preserve the old buildings instead of building new ones.

Spanish: proteger, conservar, mantener, preservar

forms: preserved, preserves, preserving

reproduce

verb

definition: When animals or plants reproduce, they make more animals and plants that are of the same kind as themselves.

Spanish: reproducir

forms: reproduced, reproduces, reproducing

trait

noun

definition: a characteristic or quality that makes a person or animal different from others.

Kindness is a trait that we look for in our friends.

A striped coat is a trait of the tiger.

Spanish: rasgo, peculiaridad

variety

noun

definition: a number of different things in a group or class.

There was a large variety of people at the party.

Spanish: variedad, diversidad

forms: varieties

Name: _____ Date: _____

1. What is artificial selection?

- A. a process through which plants create food for themselves by using carbon dioxide, water, and energy from the sun
- B. a process through which pollen from the male part of the flower is moved to the female part of the same or another flower to fertilize it
- C. a slow evolutionary process through which organisms adapt and change over time based on their environment
- D. a process through which humans influence the way species reproduce to make sure certain traits are maintained or emphasized

2. In natural selection, what causes certain traits to be passed on to future offspring and become more common throughout a species?

- A. The species are endangered and rarely reproduce because it is hard for them to come into contact with one another.
- B. The traits that are selected are the ones that are more likely to be hunted by predators.
- C. The traits are better suited to the species' environment and help the species survive and reproduce.
- D. The species die because of weather conditions before they are old enough to reproduce.

3. Read the following sentences from the text.

"By 4000 B.C., Chinese farmers began planting peach seeds and growing peach trees. They selected seeds from the tastiest and largest fruits and cross-pollinated them. These farmers and the next generations of farmers repeated this process for thousands of years. After 6,000 years of artificial selection, the peaches produced by these trees were more than 16 times larger than wild peaches!"

What conclusion can you draw from this evidence?

- A. Farmers in China preferred smaller peaches because they are easier to eat.
- B. Farmers in China preferred bigger peaches to smaller ones.
- C. Farmers in China were not able to use artificial selection with peaches.
- D. Farmers in China enjoyed sour peaches more than sweet ones.

4. When compared to natural selection, how has artificial selection affected the way peaches evolved?
- A. It has led to peaches being mostly yellow in color rather than peaches being mostly red.
 - B. It has made it more common for peaches to be small and dry versus large and juicy.
 - C. It has taken millions of years and limited the variety of peaches so that there are still only three types.
 - D. It has taken less time and has allowed for humans to select for traits like sweetness, size, and nutrition.
5. What is the main idea of this text?
- A. Chinese farmers in 4000 B.C. were planting seeds and growing peach trees and they used artificial selection to grow more of the ones they wanted.
 - B. While peaches naturally evolved thousands of years ago, people have used artificial selection to create many varieties of peaches with the traits they prefer.
 - C. Natural selection is a slow evolutionary process when living things adapt and change based on the traits that are better suited for their environment.
 - D. When you go to the grocery store, you can buy fruits and vegetables like red apples, juicy red tomatoes, and large orange peaches.
6. Read the following sentences from the text.

"Today, farmers continue to test and grow over 200 different **varieties** of peaches. They see which ones are best adapted to specific environments. They also create **varieties** that can resist certain pests or that have a particular flavor that people enjoy. These improvements make them an even more delicious and nutritious snack!"

As used in this excerpt, what does the word "**varieties**" most closely mean?

- A. different kinds
- B. comfort
- C. information
- D. sweetness

7. Choose the answer that best completes the sentence below.

Artificial selection takes less time than natural selection _____ humans can intentionally select and cross-pollinate the fruits and vegetables.

- A. moreover
- B. otherwise
- C. because
- D. finally

8. According to the text, how many varieties of peaches were there more than 2.5 million years ago in China?

9. How are artificial and natural selection similar?

10. Why might humans decide to use artificial selection on things like fruits or vegetables? Use evidence from the text to support your answer.

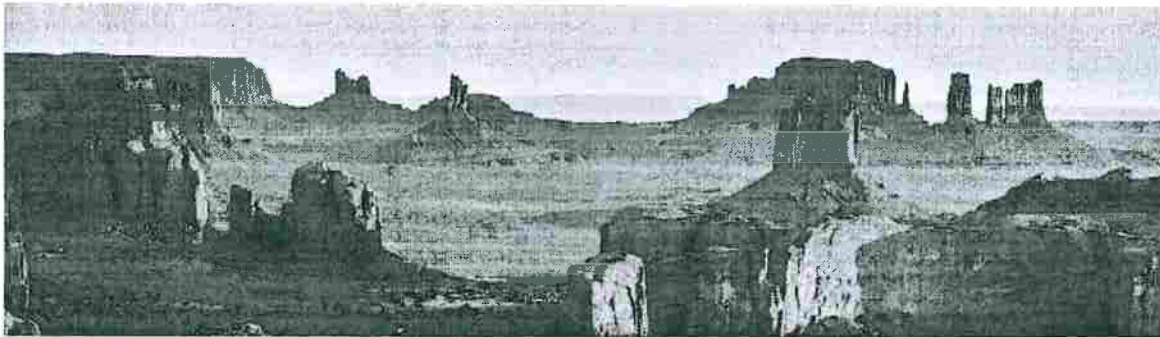
Name: _____ Date: _____

Directions: Read the text, and answer the questions.

Changes in Earth's Surface

Earth's surface is constantly changing. Changes can occur over long periods of time. They can also be quick and severe. Two great forces that change Earth's surface are erosion and weathering. Erosion is when Earth's surface is worn away and bits of rock or soil are carried away and deposited elsewhere. Moving water, wind, and ice can all cause erosion.

Weathering is similar to erosion, but during weathering, debris is not carried away. Weathering is the breakdown or change of Earth's surface due to weather conditions. It occurs mainly through the effects of wind, water, and temperature on rocks and soil. Weathering and erosion often occur together. The weathering of rock is a slow, ongoing process.



1. What are two great forces that change Earth's surface?
 - a. rain and snow
 - b. temperature and rain
 - c. weathering and erosion
 - d. snow and hail
2. The breaking down of rock, due to weathering, is _____ .
 - a. a misunderstood process
 - b. a slow and ongoing process
 - c. a quick and easy process
 - d. none of the above
3. What is the main difference between weathering and erosion?

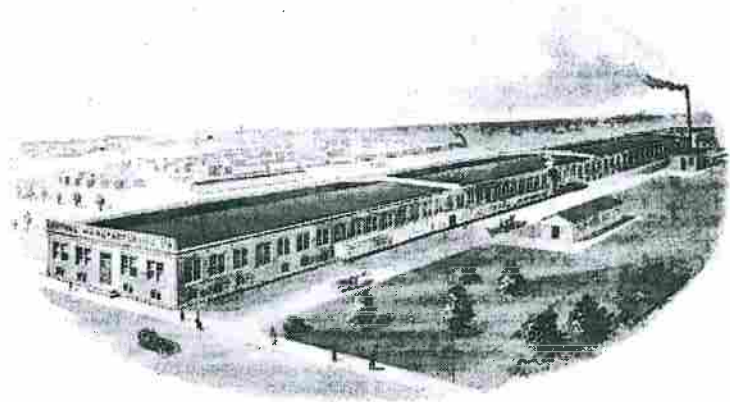


Name: _____ Date: _____

Directions: Read the text, and answer the questions.

Production is the creation of goods and services. Production turns materials into the goods that people want or need. Production can also turn knowledge and ideas into goods and services.

Four factors affect production: land, capital, labor, and enterprise. Land includes actual land. It also means the resources that come from the land. Capital is the money a company uses to purchase resources. It also includes property like buildings or vehicles. Labor is the activity of humans. They convert resources into goods or provide a service. The last factor is enterprise. Entrepreneurs manage the businesses. They make decisions and take the risk of losing capital if they are wrong.



a manufacturing company in 1906

1. What do entrepreneurs risk?
 - a. making decisions
 - b. losing money
 - c. the four factors of production
 - d. converting resources into goods

2. What is capital?
 - a. money for a business
 - b. the business managers
 - c. farm fields
 - d. the captain of a fishing boat

3. What is production?
 - a. running a business to make a profit
 - b. collecting more capital
 - c. creating the goods and services people want or need
 - d. deciding what should be created and when to do it



Colonel NTI Packet

2024 – 2025

6th Grade

Day 12

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Social Studies	Week 24, Day 2 (Economics)

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Practice Test

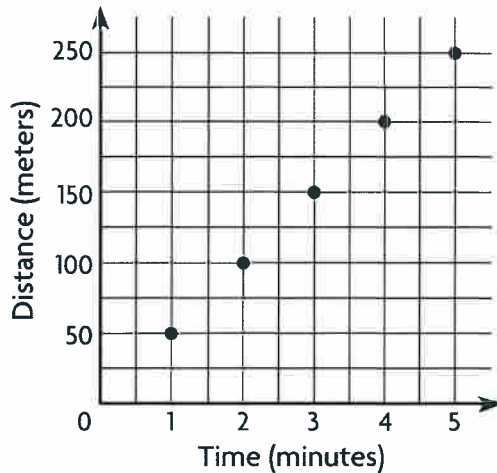


6.RP.A.2

Understand ratio concepts and use ratio reasoning to solve problems.

1. A company called Your Home Builders advertises that it can build a new home at a price of \$390 for every 15 square feet. Another company called Fast Right Now charges \$330 for every 11 square feet to build a new home. Which company charges less per square foot? Use numbers and words to explain your answer.

2. Abby goes to the pool to swim laps. The graph shows how far Abby swam over time. Use equivalent ratios to find how far Abby swam in 7 minutes.



_____ meters

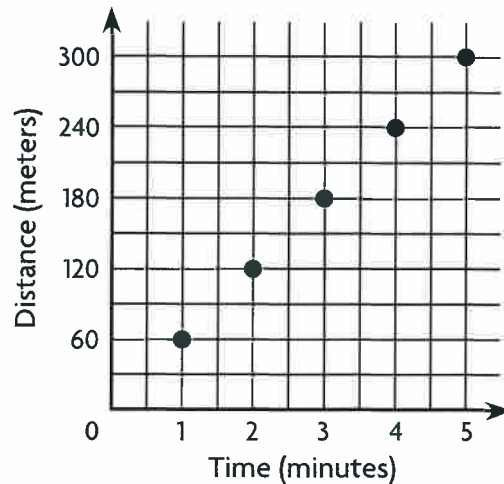
3. A rabbit runs 35 miles per hour. Select the animals who run at a faster unit rate per hour than the rabbit. Mark all that apply.
- A Reindeer: 100 miles in 2 hours
 - B Ostrich: 80 miles in 2 hours
 - C Zebra: 90 miles in 3 hours
 - D Squirrel: 36 miles in 3 hours



Name _____

4. A construction company pays its workers \$288 for 12 hours of work. A demolition company pays its workers \$225 for 9 hours of work. Which company pays less per hour? Use numbers and words to explain your answer.

5. Marc enjoys running. The graph shows how far Marc ran over time. Use equivalent ratios to find how far Marc ran in 7 minutes.



_____ meters

6. An insurance company offers a rate of \$119 per month for a health plan. Select the companies that offer a plan with a lower unit rate. Mark all that apply.
- A Company A: \$250 for 2 months
 - B Company B: \$348 for 3 months
 - C Company C: \$380 for 4 months
 - D Company D: \$500 for 4 months



The Penny Experiment

by Kyria Abrahams



Paola is 12 years old. She lives in Seville, Spain. The streets of her city are lined with beautiful orange trees. The oranges that grow here are sometimes called *Bitter Oranges*, because they are sharp to the taste. Tourists often come to Seville to see the beauty of Spain. They like to see flamenco, a colorful style of Spanish dancing, or visit a royal palace called the Alcázar.

But while all the tourists were coming to Spain, Paola and her family were off visiting New York City. They had many things to see while they were there, and seeing the Statue of Liberty was on the top of the list.

The Statue of Liberty is made of copper, but Paola noticed the statue didn't look much like copper. It was more of a bluish-green color. Once Paola noticed this, she started seeing this same color of copper all over the place. She noticed a green copper statue of the composer Beethoven in Central Park and a green copper roof on a famous old building called The Dakota.

There must be two kinds of copper, Paola thought to herself. I guess one kind of copper is green.

When Paola returned to Spain from New York, she brought home some souvenirs. One of the souvenirs wasn't something you could buy in a store, though. Paola is something of an amateur coin collector. So every time she travels, she brings home some money from that part of the world.

From this particular trip, she brought home about 30 pennies she had saved. She put them in a velvet pouch and packed it neatly in her suitcase. She had never held pennies before. In Spain, they use *euros*

Paola spread all the pennies out on her kitchen table. She noticed they all had different dates on them. Some were old, and some were brand new. One of the pennies was from 1953, which

happened to be the year Paola's grandmother was born. Paola started to organize the pennies by date when she noticed something else: the pennies were all slightly different colors.

The newer pennies were copper-colored and shiny. But the older pennies were dull and had green spots on them. This was the same kind of green color she had seen on the Statue of Liberty.

Maybe there weren't two different kinds of copper, after all. Maybe the copper was just dirty. Or maybe the copper was painted green!

Paola asked her mother why the pennies were green. Her mother explained that the pennies had gone through a process called *oxidation*. This is a chemical reaction that can take place on metal. In this case, it creates a substance on metal. This substance on copper is green. It is called *verdigris*.

Paola said, "In Spanish, the word for green is *verde*."

"That's right. Now let's see if we can recreate *verdigris* on these pennies," Mom said. "We need a glass bowl, some salt, and some vinegar."

Together, they mixed a $\frac{1}{2}$ cup of vinegar and two teaspoons of salt together in the bowl. They mixed the vinegar around until the salt dissolved. Then they put 10 of the shiny new pennies into the mixture.

"What are we doing, cooking pennies?" Paola asked.

"In a way," said Mom, laughing. "I promise I won't make you eat pennies for dinner, though."

After about five minutes, Paola emptied the bowl of vinegar, salt, and pennies into a colander over the sink, and let all the liquid drain out. Then she spread two paper towels out on the counter.

"Now separate out the pennies into two groups of five," said Mom. "Wash half with water, and leave half the way they are."

Since there were 10 pennies, Paola placed five on each paper towel. She placed the washed pennies on the right side so that she wouldn't get confused later.

The next (and hardest) part was waiting for the results. They had to let the pennies dry for about an hour while the chemistry experiment worked its magic. To pass the time, Paola went for a bike ride.

She rode her bike up the street to the *Giralda*, a very old bell tower in Seville. It was completed in the year 1198. As she passed the tower, Paola remembered it used to have a copper sphere on the top. She had learned in school that the sphere fell off during an earthquake in the year 1365. She wondered whether that sphere would also be green today if it hadn't fallen off in the earthquake.

When she returned home, she ran to the kitchen to check on her pennies. She was so excited she almost forgot to close the front door.

Here's what had happened: the pennies that had been rinsed off in water looked really shiny and not at all green.

The five unwashed pennies on the left, however, had started to turn green.

Paola hadn't painted the pennies. The vinegar mixture created a chemical reaction between the copper and the air. This is also known as *redox*, or what happens whenever atoms change their *oxidation* state. A substance of copper oxide mixed with chlorine from the salt had formed on the penny, and the substance looked green.

But, if this was how you oxidize copper, how did the Statue of Liberty turn green? Had an airplane dumped a giant bowl of vinegar over her head?

"There is more than one way for a metal to oxidize," Mom explained.

Paola's mom continued to explain that vinegar is a mild acid. When combined with salt (a neutral base), it can form hydrochloric acid, which both cleans and oxidizes copper.

When you wash it off, the penny looks shiny. When you leave it on, the penny turns green.

There are also other ways of making copper turn green, however. For example, there could be products in the air that react in different ways when combined with oxygen, such as sulfur from coal. They will behave in a similar way to the vinegar. And that is why statues and buildings might have green-colored copper.

Paola decided to recreate the experiment. This time she used some of the bitter oranges from the tree in her backyard. Oranges are also mildly acidic, just like vinegar. She followed all the steps from the first experiment, only replacing vinegar with orange juice. She got the same result.

She called to her mother, who was relaxing on the porch, thumbing through a cookbook.

"Look, Mom, I made *verdigris* with oranges, too!"

"That's great," Mom said, pointing to the cookbook. "Because I'm about to make marmalade with the rest of the oranges."

"Just make sure you leave out the pennies!" said Paola.

Vocabulary

experiment

noun

definition: a carefully planned test used to discover something unknown.
We used special equipment for the experiment.

Spanish: experimento

reaction

noun

definition: in chemistry, change that occurs as substances are combined.
The substance turns blue because of a chemical reaction.

substance

noun

definition: a particular kind of matter.
The table was covered with a sticky substance.

Spanish: sustancia

Name: _____ Date: _____

1. What do Paola and her mom perform an experiment on?

- A. coal
- B. salt
- C. pennies
- D. the Statue of Liberty

2. What is the order of events in this story?

- A. Paola wonders why some copper is green; Paola experiments; Paola understands why some copper is green.
- B. Paola experiments; Paola understands why some copper is green; Paola wonders why some copper is green.
- C. Paola experiments; Paola wonders why some copper is green; Paola understands why some copper is green.
- D. Paola understands why some copper is green; Paola experiments; Paola wonders why some copper is green.

3. Acid causes copper to turn green.

What evidence from the story supports this statement?

- A. Paola brings home 30 pennies from her trip to the United States.
- B. Paola lives in Seville, Spain, and the streets of her city are lined with orange trees.
- C. Paola's mother is going to make marmalade with oranges from the backyard.
- D. Both vinegar and orange juice cause some of Paola's pennies to turn green

4. Why does Paola's mom suggest doing an experiment on pennies?

- A. to make Paola appreciate the music of Beethoven
- B. to explain why tourists like to see flamenco performances
- C. to show Paola how copper changes color
- D. to teach Paola the history of an old bell tower

5. What is this story mainly about?

- A. the Statue of Liberty
- B. why copper changes color
- C. why people visit Spain
- D. why people visit New York City

6. Read the following sentences: "This substance on copper is green. It is called *verdigris*. Paola said, '**In Spanish, the word for green is verde.**'"

Why does the author mention that the Spanish word for green is *verde*?

- A. to show readers a connection between the word *verdigris* and the color green
- B. to prove to readers that learning Spanish is more useful than learning English
- C. to explain where the word "copper" comes from
- D. to illustrate the difficulty of learning a new language

7. Choose the answer that best completes the sentence below.

Paola does experiments with pennies; _____, she learns why copper changes color.

- A. as a result
- B. however
- C. previously
- D. first

8. What is different about the first experiment and the second experiment that Paola does?

9. What is similar about the first experiment and the second experiment Paola does?

10. Why does Paola recreate the first experiment? Support your answer with evidence from the story.

Name: _____ Date: _____

Directions: Study the chart. Then, answer the questions.

Event	Effect
moving water	Moving water slowly wears down rock surfaces. Loose particles of rock or soil are carried away and deposited elsewhere.
temperature change	When air temperature changes greatly over a few hours, rocks can expand, contract, and rupture.
transportation and sedimentation	Materials eroded by wind or water are carried away and deposited at lower elevations. These new deposits can later turn into rocks.
freezing water	When water freezes inside tiny holes or fissures in rocks, they expand and shatter.

1. When the air temperature changes greatly over a short period of time what happens to rocks?
 - a. They expand, contract, and rupture.
 - b. They remain stagnant.
 - c. They melt.
 - d. They change colors.
2. When water penetrates into rock fissures, what happens to the rocks?
 - a. They explode and regenerate.
 - b. They expand and shatter.
 - c. They roll away.
 - d. none of the above
3. Why do you think scientists study changes to Earth's crust?



Analyzing Data

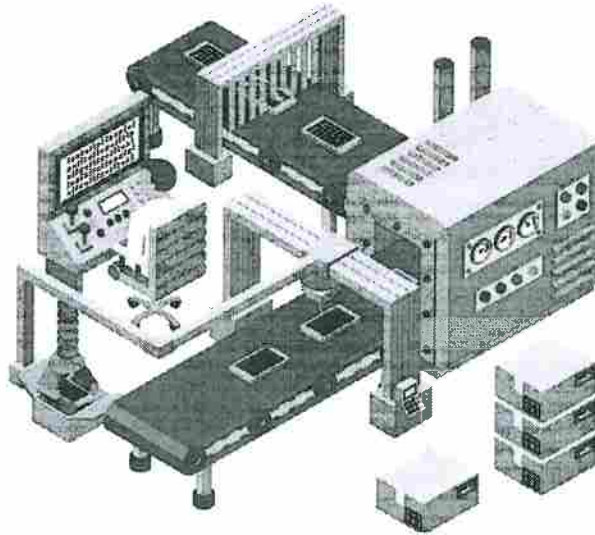
Name: _____ Date: _____

Directions: Read the text, and answer the questions.

Capital can be the tools, machines, and buildings that are needed to produce a product. These are physical items that can be bought or leased. They can wear out. They may need to be replaced. Some companies prefer to lease rather than buy. They may not be able to pay the whole price for a new product.

The capital in a factory is the machinery. The building is also a form of capital. A fishing business's capital includes boats or ships, nets, and other gear. A farming business has barns, tractors, combines, and other equipment. Capital can be used to buy a factory building or a fishing boat.

Capital can also be the money used to buy land. Land is an asset. But land is not actual capital.



1. Based on the text, what can capital be used for?
 - a. to buy lunch for all the workers
 - b. to buy physical items like a harvester
 - c. to bill customers for products they purchase
 - d. to make decisions about what should be produced
2. Why do companies sometimes lease physical items?
 - a. Leasing is a service that companies appreciate.
 - b. The company wants to use the equipment.
 - c. The company can try different kinds.
 - d. The company can't afford to pay the whole price at once.
3. Which of the following is NOT capital?
 - a. money
 - b. land
 - c. a silo
 - d. a computer