NTI Day 14

LCMS 7th Grade

Name: _____   Class: _____

Many U.S. Football players had brain disease, data show

Severe disease showed up in 99 percent of pro players whose brains had been donated to science.

By Aimee Cunningham
2018

Directions: Read the passage and answer the questions that follow.

watching football it's clear that it's a rough sport and can cause serious physical injuries. But how dangerous is it to players' brains? In this informational text, Aimee Cunningham discusses a study that looks at football players' brains and the effects of repeated hits to the head. As you read, take notes on the long-term effects that hits to the head can cause football players.

[1]   American football is a very rough and tumble sport. A career of hard knocks and smashups can take a brutal toll on players' bodies. That includes their brains, a new study shows. Most football players whose brains were donated at death for research showed severe damage, according to the largest study to date.

The finding provides more evidence linking serious brain disease with repetitive head injuries sustained during years of playing American football.

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The authors caution, however, that they don't know how representative the brains were that they studied. Players and their families had offered up these brains for study. Their choosing to do so may reflect that many of these players already had major symptoms of brain damage. So these may have been a self-selected group of the most injured of players, not a representative mix of all players. Still, the study's authors find their new results worrisome.

They examined the brains of 202 former football players. Of them, 177 had CTE, short for chronic traumatic encephalopathy (En-sef-uh-LOP-ah-thee). The term means a brain has sustained long-term damage. CTE's symptoms can include mood and behavioral issues as well as problems with thinking and reasoning.

[5]   Men who had played in the National Football League donated 111 of the brains studied. And 110 of these — a whopping 99 percent — had CTE. So did three of 14 high school players and 48 of 53 college players.

Twenty-seven researchers from eight universities, hospitals and research groups took part. The team based its diagnoses on brain autopsies.[1] It also interviewed family and friends about any symptoms the players had experienced. The researchers described their disturbing findings July 25 in JAMA.

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"The fact that [CTE] was so common adds to our concern about the safety of playing football," says Gil Rabinovici. As a neurologist, he studies nerve tissues and the brain at the University of California, San Francisco. He also offered an editorial accompanying the new report. The strong link between brain damage and football injuries, he says, "hovers like a dark cloud over the game at all levels." And that's true "even if the study cannot address how frequent the disease is, or who is at risk."

Growing concerns over football's risk of CTE

CTE can show up in athletes and others who've had repetitive head injuries, such as concussions.[2] The only way to diagnose CTE is with an autopsy. In affected brains, a protein called tau goes "bad." It inappropriately forms clumps in nerves and other brain cells. A tau buildup occurs in other brain diseases, too — such as Alzheimer's. But where it builds up is different in CTE. Here, the protein congregates[3] in cells around small blood vessels.

In 2008, researchers set up a brain bank to collect tissues for study. Its goal was to probe the long-term effect of head blows sustained in sports and military service. The new study focused on brains from football players provided to that tissue bank.

[10] Neurologist Jesse Mez of Boston University School of Medicine, in Massachusetts, and his colleagues classified CTE cases as mild or severe. Their ratings were based on how widespread the tau clumps were within a brain. The severity of disease seemed to track with how long the men had spent playing football, Mez says. Among NFL players, 95 of the 110 diagnosed cases were severe. In contrast, all three high school players' cases were mild. Among cases in college players, just over half were judged severe.

The symptoms reported by family members were not a good gauge of how bad a man's brain damage had been. Behavioral and mood problems — such as impulsivity, anxiety and depression — commonly showed up in both severe and mild cases of CTE. Cognitive[4] symptoms, including memory loss, also were about the same in both groups. One big difference: dementia.[5] It was more common in men with severe CTE than in those who had mild cases.

Why symptoms so poorly correlated[6] with the severity of brain disease is puzzling, Mez says. "The question is: Is there something else going on?" such as inflammation.

There still isn't a way to diagnose CTE during life. And that's "the 800-pound gorilla in the room," says neurologist David Brody. He works at Washington University School of Medicine in St. Louis, Mo.

Yet detecting CTE in living patients will be crucial[7] for understanding how common it is in the NFL, "let alone in the millions of people who participated in college, high school and youth football," says Rabinovici. For now, he says, "We need to focus on prevention of concussions and other head impacts at all levels of contact sports."

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1. an examination of a body after death, typically to determine cause of death
2. a brain injury caused by a serious blow to the head that can cause dizziness, forgetfulness, and unconsciousness
3. **Congregate (verb):** to gather together into a group or mass
4. relating to mental processes of thinking and reasoning
5. a general term for a decline in mental ability and memory loss that is severe enough to interfere with daily life
6. to have a close connection with something
7. **Crucial (adjective):** of great importance; critical

Text-Dependent Questions

Directions: For the following questions, choose the best answer or respond in complete sentences.

1. PART A: Which statement identifies the central idea in the text?
   A. Many football players' CTE went undiagnosed until after they died, as they weren't able to recognize the cognitive symptoms.
   B. Studies of deceased football players' link their participation in the violent sport with the development of a serious brain disease.
   C. CTE is a common brain disease that people experience after being hit in the head, but it is most common with military personnel and football players.
   D. Studies of deceased football players' brains have shown that people are more at risk of developing serious brain diseases when they play at a young age.

2. PART B: Which detail from the text best supports the answer to Part A?
   A. "Men who had played in the National Football League donated 111 of the brains studied. And 110 of these — a whopping 99 percent — had CTE." (Paragraph 5)
   B. "In 2008, researchers set up a brain bank to collect tissues for study. Its goal was to probe the long-term effect of head blows sustained in sports and military service." (Paragraph 9)
   C. "The symptoms reported by family members were not a good gauge of how bad a man's brain damage had been." (Paragraph 11)
   D. "There still isn't a way to diagnose CTE during life. And that's 'the 800-pound gorilla in the room,' says neurologist David Brody." (Paragraph 13)

3. How does paragraph 3 contribute to the development of ideas in the text?
   A. It shows how the brains selected for the study might not have been typical examples of a football player's brain.
   B. It reveals that scientists only selected brains from players who had been showing signs of CTE before they died.
   C. It questions whether or not the study was conducted in a fair fashion, and whether the results should be trusted.
   D. It emphasizes that the selection of the brains for the study was done at random so as to not influence the results in any way.

4. What effect does the phrase "hovers like a dark cloud over the game at all levels" have on the passage's meaning (Paragraph 7)?
   A. It emphasizes how there is no way for football player to avoid the effects of CTE.
   B. It stresses how CTE can easily develop in football players without their knowledge.
   C. It suggests that CTE is always a present risk for those who choose to play football.
   D. It shows how the symptoms of CTE worsen over time for affected football players.

5.   How does the author's discussion of CTE in players of all levels of football contribute to our understanding of the dangers involved in the sport?

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Discussion Questions

Write

Directions: ~~Brainstorm~~ *your answers to the following questions in the space provided. Be prepared to share your original ideas in a class discussion.*

1. In the text, the author states that CTE can't be diagnosed in people while they're still alive. How do you think it would be beneficial to people with CTE to have it diagnosed while they were still alive? How do you think it could help doctors in their work preventing CTE in football players?

2. In the context of the text, how are specialists working to combat the frequency of CTE in football players? What else do you think could be done to better protect football players form brain injury and the brain disease that could potentially follow?

NTI Day 14

Section 4

Complete the Following Activities

Meeting People

- Take notes over each person at least three bullets per person.

Building Vocab

- Write each definition

Reading Strategy

- Read the directions for the reading strategy and complete the diagram.

Section 4 Review

- Complete Section 4 Review Questions 1-5 on PG 436.

Section 4

The Ming Dynasty

Get Ready to Read!

What's the Connection?

In Section 3, you read about the Mongol conquest. Eventually, the Chinese drove the Mongols out, and a new dynasty arose.

Focusing on the Main Ideas

- Ming rulers strengthened China's government and brought back peace and prosperity. *(page 431)*

- During the Ming dynasty, China sent a fleet to explore Asia and East Africa. *(page 433)*

Locating Places

Nanjing (NAHN•JIHNG)
Portugal (POHR•chih•guhl)

Meeting People

Zhu Yuanzhang
(JOO   YOO•AHN•JAHNG)
Yong Le (YUNG   LEE)
Zheng He (JUNG   HUH)

Building Your Vocabulary
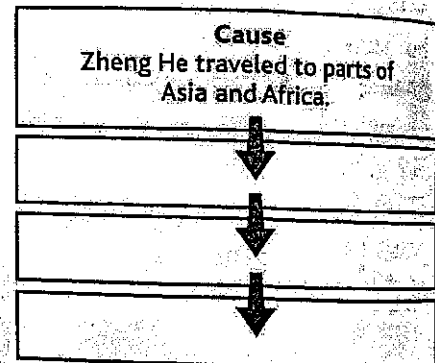
treason (TREE•zuhn)
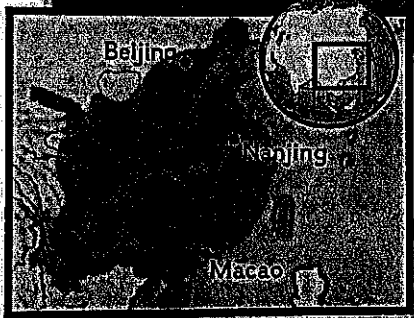census (SEHN•suhs)
novel (NAH•vuhl)
barbarian (bahr•BEHR•ee•uhn)

Reading Strategy

Cause and Effect Use a chart like the one below to show cause-and-effect links in China's early trade voyages.

Cause
Zheng He traveled to parts of Asia and Africa.
↓
↓
↓

NATIONAL GEOGRAPHIC When & Where?

Beijing
Nanjing
Macao

1400   **1500**   **1600**

1405
Zheng He begins first overseas voyage

1514
Portuguese ships arrive in China

1644
Ming dynasty falls

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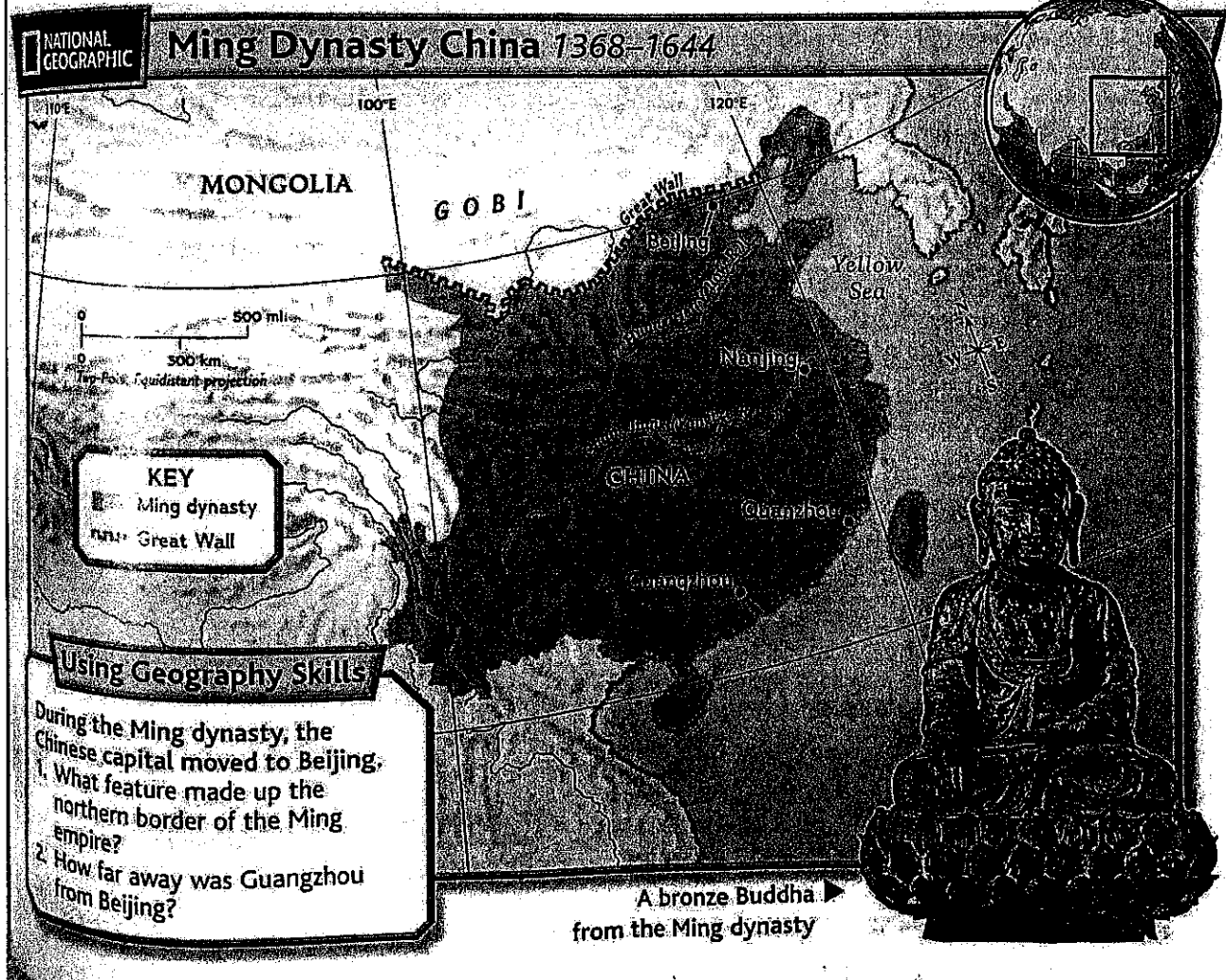
The Rise of the Ming

Main Idea Ming rulers strengthened China's government and brought back peace and prosperity.

Reading Focus Think about all the different things the government does for people. Imagine if you were running the government and had to rebuild the country after a war. What would you do? Read to learn how the Ming rulers in China rebuilt their country after the Mongols left.

Kublai Khan died in 1294. A series of weak rulers followed him, and Mongol power began to decline. During the 1300s, problems mounted for the Yuan dynasty. Mongol groups in Mongolia to the north broke away. At the same time, many Chinese resented Mongol controls and wanted their own dynasty.

How Did the Ming Dynasty Begin? A series of rebellions finally drove out the Mongols. In 1368 a rebel leader named Zhu Yuanzhang (JOO YOO•AHN•JAHNG) became emperor. Zhu reunited the country and set up his capital at Nanjing (NAHN•JIHNG) in southern China. There, he founded the Ming, or "Brilliant," dynasty.

As emperor, Zhu took the name Hong Wu, or the "Military Emperor." He brought back order, but he also proved to be a cruel leader. Hong Wu trusted no one and killed officials he suspected of treason (TREE•zuhn), or disloyalty to the government. Hong Wu ruled China for 30 years. When he died in 1398, his son became emperor and took the name of Yong Le (YUNG LEE).

NATIONAL GEOGRAPHIC

Ming Dynasty China 1368–1644

MONGOLIA

GOBI

Great Wall

Beijing

Yellow Sea

Nanjing

CHINA

Guangzhou

500 mi

500 km

Two-Point Equidistant projection

KEY
Ming dynasty
Great Wall

Using Geography Skills

During the Ming dynasty, the Chinese capital moved to Beijing.
1. What feature made up the northern border of the Ming empire?
2. How far away was Guangzhou from Beijing?

A bronze Buddha ▶ from the Ming dynasty

▲ This image, from a Ming dynasty vase, shows Chinese farmworkers collecting tea.

Yong Le worked hard to show that he was a powerful emperor. In 1421 he moved the capital north to Beijing. There, he built a large area of palaces and government buildings known as the Imperial City. The very center of the Imperial City was known as the Forbidden City. Only top officials could enter the Forbidden City because it was home to China's emperors.

The Forbidden City had beautiful gardens and many palaces with thousands of rooms. The emperor and his court lived there in luxury for more than 500 years. The buildings of the Forbidden City still exist. You can visit them if you travel to China.

How Did the Ming Reform China?

Ming emperors made all the decisions, but they still needed officials to carry out their orders. They restored the civil service examinations and made the tests even harder. From time to time, Ming officials carried out a census (SEHN•suhs), or a count of the number of people. This helped them collect taxes more accurately.

With the strong government of the early Ming emperors providing peace and security, China's economy began to grow. Hong Wu ordered many of the canals and farms destroyed by the Mongols to be rebuilt and ordered people to move to the new farms. He also ordered new forests to be planted and new roads to be paved.

Agriculture thrived as farmers worked on the new lands and grew more crops. Ming rulers repaired and expanded the Grand Canal so that rice and other goods could again be shipped from southern to northern China. They imported new types of rice from southeast Asia that grew faster. This helped feed the growing number of people living in cities. The Ming also supported the silk industry and encouraged farmers to start growing cotton and weaving cloth. For the first time, cotton became the cloth worn by most Chinese.

Chinese Culture

Chinese culture also advanced under the Ming. As merchants and artisans grew wealthier, they wanted to learn more and be entertained. During the Ming period, Chinese writers produced many novels (NAH•vuhls), or long fictional stories. The Chinese also enjoyed seeing dramas on stage. These works combined spoken words and songs with dances, costumes, and symbolic gestures.

Reading Check Identify What was the Forbidden City?
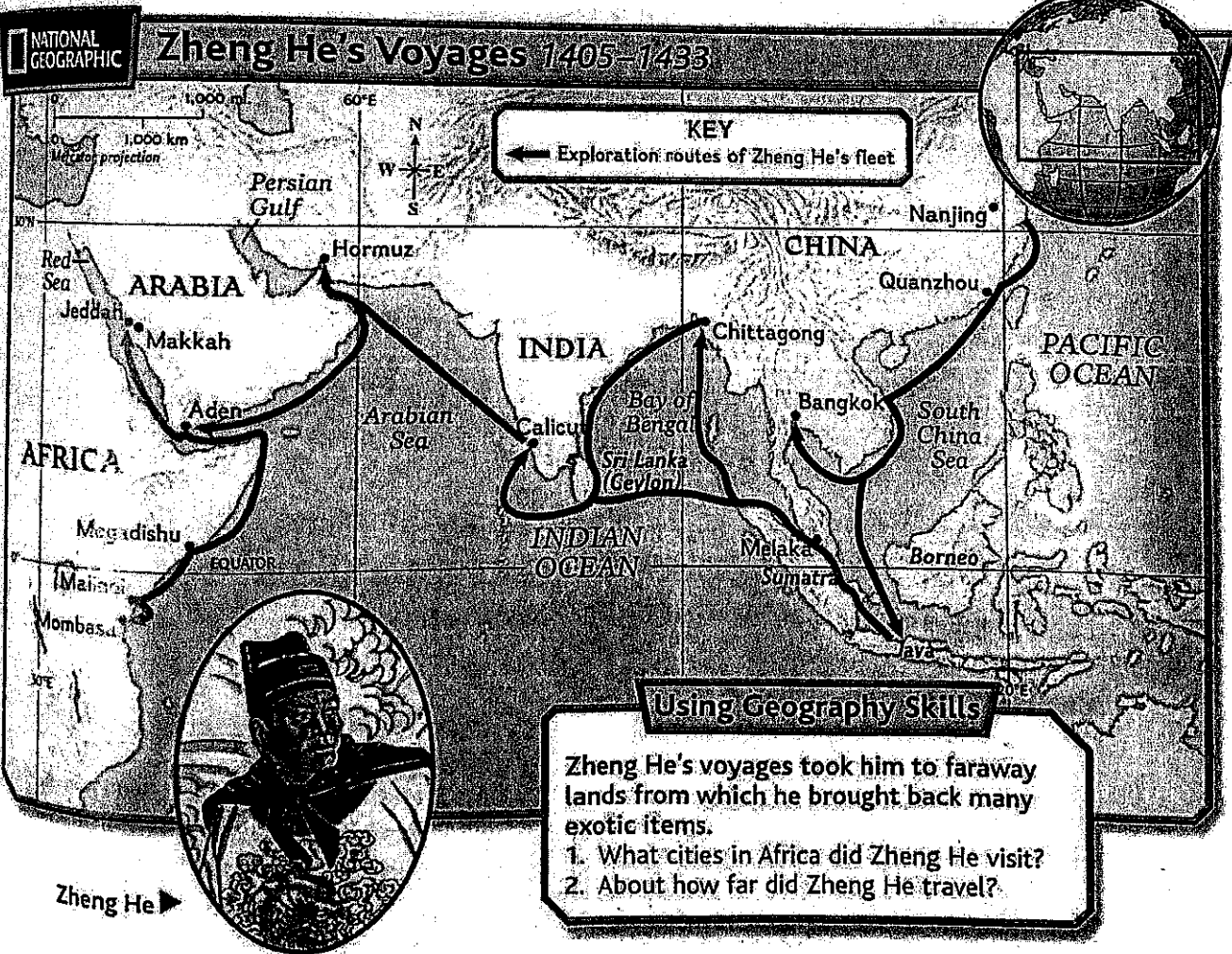
China Explores the World

Main Idea During the Ming dynasty, China sent a fleet to explore Asia and East Africa.

Reading Focus You probably have heard of Christopher Columbus and his trip to America. Imagine if China had sent ships to America first. Read to learn about Chinese explorations of Asia and East Africa.

Early Ming emperors were curious about the world outside of China. They also wanted to increase China's influence abroad. To reach these goals, Ming emperors built a large fleet of ships. The new ships usually traveled along China's coast. However, they could also sail in the open sea.

Who Was Zheng He? From 1405 to 1431, Emperor Yong Le sent the fleet on seven overseas voyages. The emperor wanted to trade with other kingdoms, show off China's power, and demand that weaker kingdoms pay tribute to China.

The leader of these journeys was a Chinese Muslim and court official named Zheng He (JUNG HUH). Zheng He's voyages were quite impressive. His first fleet had 62 large ships, 250 smaller ships, and almost 28,000 men. The largest ship was over 440 feet (134 m) long. That made it more than *five times* as long as the *Santa María* that Christopher Columbus sailed almost 90 years later!

NATIONAL GEOGRAPHIC

Zheng He's Voyages 1405–1433

KEY
← Exploration routes of Zheng He's fleet

Using Geography Skills

Zheng He's voyages took him to faraway lands from which he brought back many exotic items.
1. What cities in Africa did Zheng He visit?
2. About how far did Zheng He travel?

Zheng He ▶

Where Did Zheng He Travel? Zheng He took his first fleet to southeast Asia. In later voyages, he reached India, sailed up the Persian Gulf to Arabia, and even landed in East Africa. In these areas, Zheng He traded Chinese goods, such as silk, paper, and porcelain. He brought back silver, spices, wood, and other goods. From Africa, Zheng He returned home with giraffes and other animals for the emperor's zoo.

As a result of Zheng He's voyages, Chinese merchants settled in Southeast Asia and India. There, they not only traded goods but also spread Chinese culture. Chinese merchants at home and abroad grew rich from the trade of the voyages and added to China's wealth.

Despite these benefits, Chinese officials complained that the trips cost too much. They also said that trips were bad for China's way of life because they brought in new ideas from the outside world and helped merchants become rich.

Confucius had taught that people should place loyalty to society ahead of their own desires. To the officials, China's merchants were disobeying this teaching by working to gain money for themselves.

After Zheng He's death, the Confucian officials persuaded the emperor to stop the voyages. The boats were dismantled, and no more ships capable of long distance ocean travel were allowed to be built. As a result, China's trade with other countries sharply declined. Within 50 years, the shipbuilding technology was forgotten.

The Europeans Arrive in China Chinese officials were not able to cut off all of China's contacts with the outside world. In 1514 a fleet from the European country of Portugal (POHR•chih•guhl) arrived off the coast of China. It was the first time Europeans had ever sailed to China and the first direct

▲ Italian missionary Matteo Ricci (left) was one of the most famous Europeans to visit China. He helped in the development of math and science in China during the late 1500s.

contact between China and Europe since the journeys of Marco Polo.

The Portuguese wanted China to trade with their country. They also wanted to convince the Chinese to become Christians. At the time, the Ming government was not impressed by the Portuguese. China was at the height of its power and did not feel threatened by outsiders. The Chinese thought the Europeans were **barbarians** (bahr•BEHR•ee•uhns), or uncivilized people.

At first, the Chinese refused to trade with the Portuguese, but by 1600, they had allowed Portugal to set up a trading post at the port of Macao (muh•KOW) in southern China. Goods were carried on European ships between Macao and Japan. Still, trade between China and Europe remained limited.

Despite restrictions, ideas from Europe did reach China. Christian missionaries traveled to China on European ships. Many of these missionaries were Jesuits, a special group of Roman Catholic priests. They

▲ This porcelain bowl is from the Ming dynasty. **Where in China did the Portuguese set up a trading post?**

were highly educated, and their scientific knowledge impressed the Chinese. To get China to accept European ideas, the Jesuits brought with them clocks, eyeglasses, and scientific instruments. Although they tried, the Jesuits did not convince many Chinese to become Christians.

Why Did the Ming Dynasty Fall?

After a long era of prosperity and growth, the Ming dynasty began to decline. Ming emperors had gathered too much power into their own hands. With the emperor having so much control, officials had little desire to make improvements. As time passed, Ming rulers themselves became weak. Greedy officials who lived in luxury took over the country. They placed heavy taxes on the peasants, who began to revolt.

As law and order disappeared, a people called the Manchus attacked China's northern border. The Manchus lived to the northeast of the Great Wall in an area known today as Manchuria. The Manchus defeated Chinese armies and captured Beijing. In 1644 they set up a new dynasty.

Reading Check **Cause and Effect** What caused the Ming dynasty to decline and fall?

History Online
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Section 4 Review

Reading Summary
Review the Main Ideas

• The Ming dynasty rebuilt and reformed China after the Mongols were driven out. Their dynasty restored peace and prosperity to China.

• During the Ming dynasty, China's contacts with the outside world increased as Zheng He led fleets to faraway lands and European ships began arriving in China.

What Did You Learn?

1. What was the purpose of the Forbidden City and where was it located?

2. How did the Chinese react to the arrival of Portuguese traders in 1514?

Critical Thinking

3. **Organizing Information** Draw a diagram like the one below. Fill in details about the achievements of the Ming dynasty.

Ming Dynasty Achievements

4. **Cause and Effect** Why did Ming rulers repair and expand the Grand Canal?

5. **Summarize** Why did the Emperor Yong Le send Zheng He on his voyages? How did Zheng He's voyages benefit China?

6. **Persuasive Writing** Imagine you are living in China at the time of Zheng He's voyages. Write a newspaper editorial either for or against the voyages. Describe why you think the voyages are aiding or hurting the country as a whole.

7. **Predict** What do you think happened after China tried to limit trade?

NTI Day 14: Making Predictions with Experimental Probability

Probability: Measures the likelihood that the event will occur. We use the following formula to determine probability

$$P(\text{event}) = \frac{\textit{Number of outcomes in the event}}{\textit{Number of outcomes in the sample space}}$$

Examples of making predictions

Ex1) A car rental company sells accident insurance to 24% of its customers. Out of 550 customers, about how many customers are predicted to purchase insurance?

Total amount of customers multiplied by the percent.

24% buys insurance x 550 total customers = 132 customers buy insurance

Ex2) On average, 24% of customers who buy shoes in a particular store buy two or more pairs. One weekend, 350 customers purchased shoes. How many can be predicted to buy two or more pairs? If 107 customers buy more than two pairs, did more customers than normal buy two or more pairs.

24% customers who buy x 350 total customers = 84 total customers.

Yes, more customers bought two or more pairs than usual. Our prediction suggested 84 customers would buy multiple pairs of shoes and 107 actually purchased multiple pairs.

Problems:

1) A baseball player reaches first base 30% of the times he is at bat. Out of 50 times at bat, about how many times will the player reach first base?

2) The experimental probability that it will rain on any given day in Houston, Texas, is about 15%. Out of 365 days, about how many days can residents predict rain?

3) A catalog store has 6% of its orders returned for a refund. The owner predicts that a new candle will have 812 returns out of 16,824 sold. Do you agree with this prediction? Explain.

4) A light-rail service claims to be on time 98% of the time. Jeanette takes the light-rail 40 times one month, how many times can she predict she will be on time? Is the light-rail's claim accurate if she is late 6 times?

5) On average, a college claims to accept 18% of its applicants. If the college has 5,000 applicants, predict how many will be accepted. If 885 applicants are accepted, is the college's claim accurate?
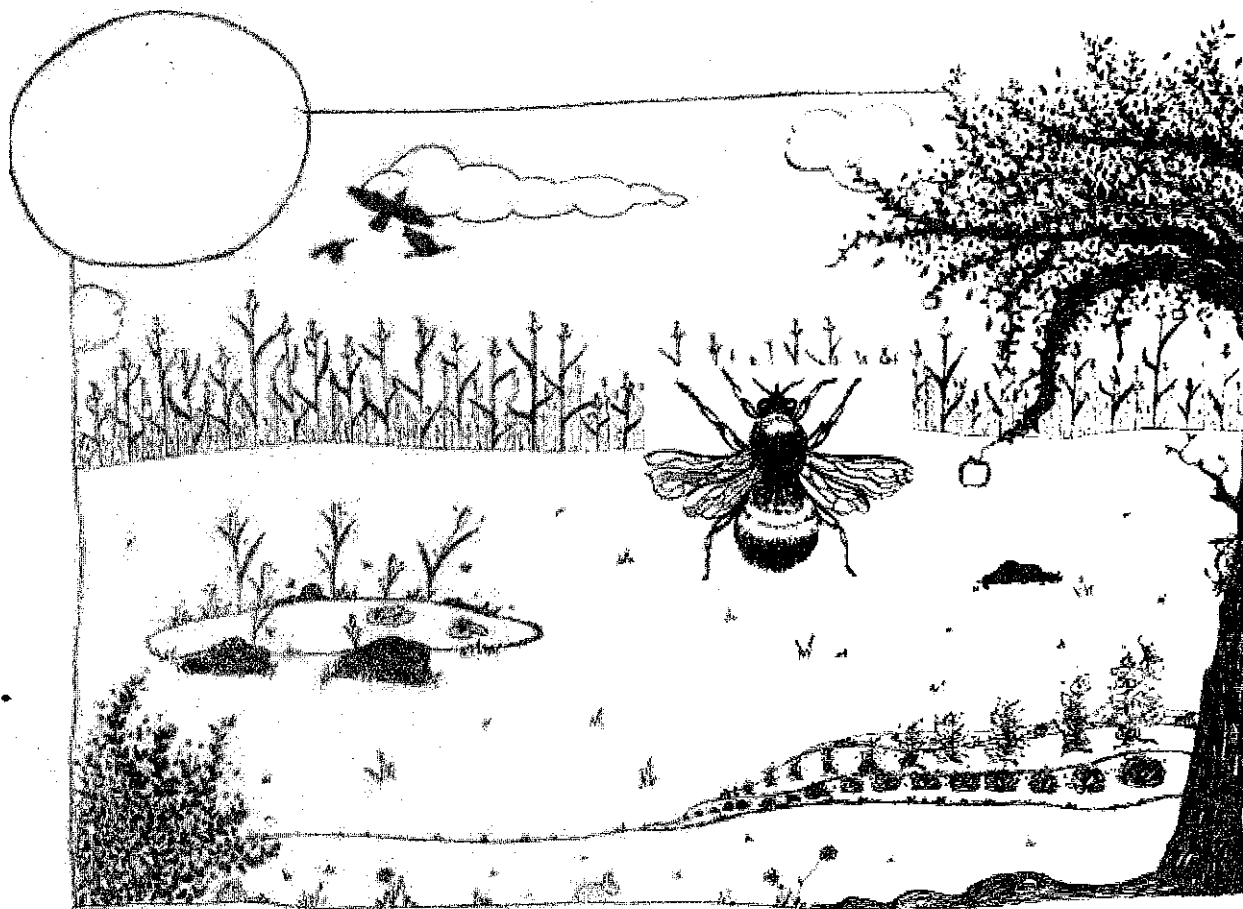
Garden Ecosystem Diagram

Use the given diagram of a garden ecosystem and the information you gathered from Day 13 NTI Science Pages 1-3 to complete this task. Think about how the honeybee interacts with the components previously identified in this system then complete the following directions:

Part A Directions:

Add arrows to the diagram to show the following interactions between the bee and other components in the ecosystem.

	Bee depends on this component of the system for survival.
	This component of the system depends on the bee for survival.
	The bee and a component depend on each other for survival

There has been much concern about the honey bee population decreasing. Consider how the system would be affected if all honey bees no longer existed?

Part B Directions:

Circle the components of this system that would be affected if all the bees left or died.

Part C Directions:

Explain how and why the things you circled would happen to animals/plants if the bees left the area or died. Give at least 3 specific examples to support your explanation.

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