PURDUE UNIVERSITY | College of Agriculture

Student Study Guides
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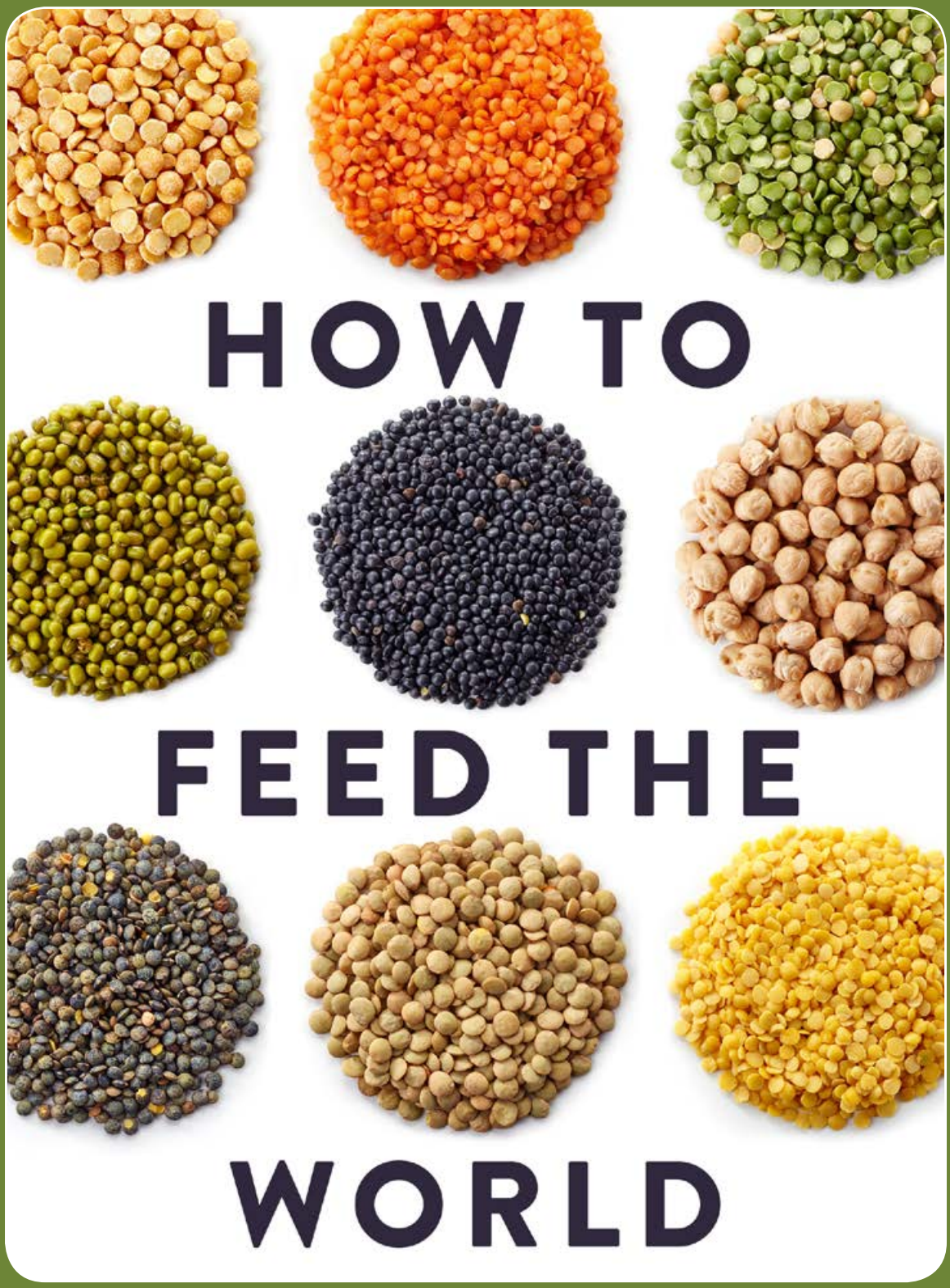


Table of Contents

Chapter One

Fact Gathering and Information

Chapter Title: 1. _____ .

What are some of your personal life choices that may affect global population?

2. _____ 3. _____ 4. _____ and

5. _____ .

To decide how many children to have and how to live demands a 6. _____ and

7. _____ .

For the most part, world population has been growing steadily since the first 8. _____ about 10,000 years ago.

England was the first country to go from 9. _____ and 10. _____ to

11. _____ and 12. _____ .

Although Mexico's life expectancy rose from 57 years in 1960 to 77 years in 2014, fertility dropped from 6.8 to 2.2 babies because of government-sponsored 13. _____ .

The biggest population increases are expected on the 14. _____ continent.

By the end of the century, 15. _____ are projected to account for less than 6% of the world's population.

If a fertility decline happens fast enough, a country (South Korea, for example), may enjoy a 16. _____ _____ .

The severe shortage of health care in Malawi is in part due to doctors and nurses who were trained there

17. _____ .

All developed nations became increasingly 18. _____ as they transitioned from agricultural to industrialized 19. _____.

20. _____ consume much more meat.

continued next page

The driving force behind today's unequal population growth is due to the 21. _____ in 22. _____ and 23. _____ countries.

24. _____ argued that unchecked population growth would lead to food shortages and famines.

Boserup argues that 25. _____ leads to intensification, new technologies, and eventual development and prosperity.

Geography

These countries were mentioned in this chapter. Mark their correct locations on the map.
Print this page if necessary.

United States	Mozambique	Germany	Afghanistan
Canada	China	Australia	South Korea
England	India	New Zealand	Malawi
Japan	Niger	Singapore	Thailand
Mexico	Italy	Haiti	Angola
Myanmar			

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. The author's primary purpose was to
☐ a. warn about the consequence of unchecked population.
☐ b. discuss the reasoning and assumptions behind a theory.
☐ c. present and analyze population data.
☐ d. describe sub-Saharan Africa fertility rates.

2. A population optimist
☐ a. would agree with Robert Malthus.
☐ b. would argue that climate change is solely due to megacities.
☐ c. would push building a lunar space station.
☐ d. would talk about the development of new and hardy crops.

3. Medical experts born and trained in Malawi who then emigrate to another country are most likely to be considered
☐ a. the "best and the brightest."
☐ b. a "brain drain."
☐ c. the "X generation."
☐ d. a "moral majority."

4. Refer to Figure 1.2 for this question.
If the population for 2090 is 8 billion, one reason the author might give for this number is
☐ a. an Ebola virus pandemic.
☐ b. no access to birth control.
☐ c. a new, cheap food supply.
☐ d. the growth of megacities.

5. The population of Northern America and Oceania is younger than its European counterpart due to
☐ a. fertility.
☐ b. immigration.
☐ c. infant mortality.
☐ d. industrialized economies.

Investigation and Internet Research

■ What is the population of your city, state, and country? Is it growing or shrinking?

■ Are there any mega cities located near you?

■ What is your country's fertility rate?

In the book, it states that England's mortality rate after industrialization dropped in large part due to the major decline in infectious diseases such as cholera, small pox, and typhus.

■ Describe how one of these diseases is spread.

■ Are there vaccinations for these diseases?

■ Have there been any cases of these diseases reported in your area?

Writing Focus

1. At the very beginning of the chapter, the author writes: The world's growing population is more than a matter of numbers. Explain what the author means by this.

2. Without out any other information, you are told that someone has seven children. Most likely, are they from sub-Saharan Africa or Canada? Defend your answer using material from the chapter.

3. Discuss Megacities. Define, name at least three, and list some of the problems they might create or face.

Chapter Two

Fact Gathering and Information

Chapter Title: 1. _____ .

2. _____ is when there is not enough quality water for what it is needed for.

The volume of water on Earth is approximately 3. _____ over time due to 4. _____ .

All the sources of water that are useful or potentially useful to humans are 5. _____ .

The two major categories of water sources are 6. _____ resources and 7. _____ resources.

Surface and ground water sources are known as 8. _____ resources.

Moisture that seeps into soil during rain and is sucked up by plants for growth is referred to as 9. _____ .

Treated wastewater or waste water from sinks and showers that could be used for irrigation is considered to be a 10. _____ resource.

11. _____ water is water that passes through a plant and is released back into the atmosphere as water vapor.

A crop's 12. _____ is the ratio of grain to total biomass.

Transportation water loss is a function of the plant physiology but it is also very sensitive to 13. _____ _____ .

Water that was used during a plant's growth but is no longer contained in the actual food is called 14. _____ .

The volume of water needed to produce a final product is called the 15. _____ .

16. _____ occurs when precipitation is lower than normal conditions for the time of year.

One way to help deal with water scarcity is to improve 17. _____ health.

continued next page

One way of dealing with increased rainfall variability is to develop and use 18. _____ systems.

19. _____ is a method for delivering water to plants at a regular interval.

The primary purpose of large scale dams built in the United States was 20._____ .

Some costs equated with dam construction are the displacement of people as well as the 21. _____ of the stream network.

When an aquifer is recharged, rainwater percolates down through the overlying soil. Water from the 22. _____ is being mined much faster than it can be recharged.

When excess nutrients from fertilizers applied to agricultural fields are carried downstream into coastal and freshwater ecosystems, they can create 23. _____ zones.

Excess nutrients cause more 24. _____ to grow, and when they decay, they deplete even more oxygen in the water, thus creating the dead zones.

Farmers around the Mexico City basin stopped using 25. _____ for irrigation.

Geography

These countries and places were mentioned in this chapter. Mark their correct locations on the map. *Print this page if necessary.*

- United States
- China
- Bangladesh
- Saudi Arabia
- Israel
- India
- Gulf of Mexico
- Mexico

Draw in these rivers:

- Ohio
- Mississippi
- Yangtze
- Colorado
- Columbia
- Missouri

Investigation and Internet Research

■ Look up the Three Gorges Dam in China. List three positive and three negative comments about its construction.

■ Look up the average rainfall for your area and state. How it has changed over time?

■ Find your city's and your school's source of water.

■ What states make up the Corn Belt?

■ What states does the Ogallala aquifer lie under?

■ Find a water footprint calculator on line. Use the personal one. Next, find a food one. Write down the water footprint amount for four different foods.

Writing Focus

1. Explain why some shrimp farmers in Alabama might be concerned about agricultural runoff.

2. Explain green, blue, and grey water, giving examples of each.

3. Do you think people should pay for water? How? Should every gallon be the same price? What if the water is going to a school or hospital? What if it is for a factory or farm?

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. What phrase best describes the situation when a salmon cannot longer go upstream to spawn?
☐ a. rainfall harvesting
☐ b. recharging of an aquifer
☐ c. transpiration
☐ d. fragmentation of a stream network

2. Most likely, the authors wanted the reader to
☐ a. review the hydraulic cycle.
☐ b. understand water supply.
☐ c. weigh the merits of building dams.
☐ d. fear hypoxia.

3. Most likely, what would have the greatest water footprint?
☐ a. tomatoes grown in your backyard
☐ b. a hamburger patty because of the amount of water a cow needs to drink
☐ c. tomatoes grown in a greenhouse
☐ d. a hamburger patty because of the amount of water needed to grow the food the cow needs

4. All of a sudden and for the first time the wells in a small 50-year-old subdivision go dry. A likely explanation might be that
☐ a. a near-by dam collapsed due to heavy rainfall.
☐ b. the wells were shallow and dug over 50 years ago.
☐ c. near-by farmers are pumping up larger amounts of groundwater than usual for irrigation.
☐ d. the land above the aquifer has collapsed because of the amount of water that has been drained.

5. The authors would most likely agree with what statement?
☐ a. Only the people living above the Ogallala aquifer should use the water.
☐ b. Scientists need to learn how to remove salt from ocean water so it can be used for irrigation.
☐ c. We must prepare ourselves for changes in precipitation and other factors that make up our climate.
☐ d. The price of water should be raised so that people use less water.

Chapter Three

Fact Gathering and Information

Chapter Title: 1. _____ .

Even if our attitude has changed about land our 2. _____ upon it has not.

3. _____ is no longer a precursor to wealth and influence.

By thinking of our land as vast and plentiful, when in fact, it isn't, we are putting ourselves and 4. _____ _____ at risk.

When the United States was being colonized and settled, 5. _____ of farmland was of less concern because new land was always available.

During the 6. _____ , over 100 million acres were lost to drought and erosion.

The expense of installing 7._____ to minimize the loss of soil sediment and nutrients is staggering.

Some 98 percent of the population worked in agriculture 200 years ago, and today it is less than 8. _____ .

The primary reason for disappearing prime farmland is 9. _____ .

It takes roughly 10. _____ to create one inch of soil.

All three types of farmland: 11. _____, 12. _____, and 13._____ are all 14. _____.

Data is collected on both 15. _____ and 16. _____.

A trend that cannot be allowed to continue is the disproportionate loss of 17. _____.

We 18. _____ have enough farm and ranchland to support future generations.

A 19. _____ won't meet the needs of future generations because those who will depend on the farmland are not here to participate in today's land markets.

continued next page

20. _____ is when one can't convert former farmland back into productive farmland again.

It took 21. _____ to get farmers to give up less profitable cropland and convert it to a less intensive use during the Dust Bowl.

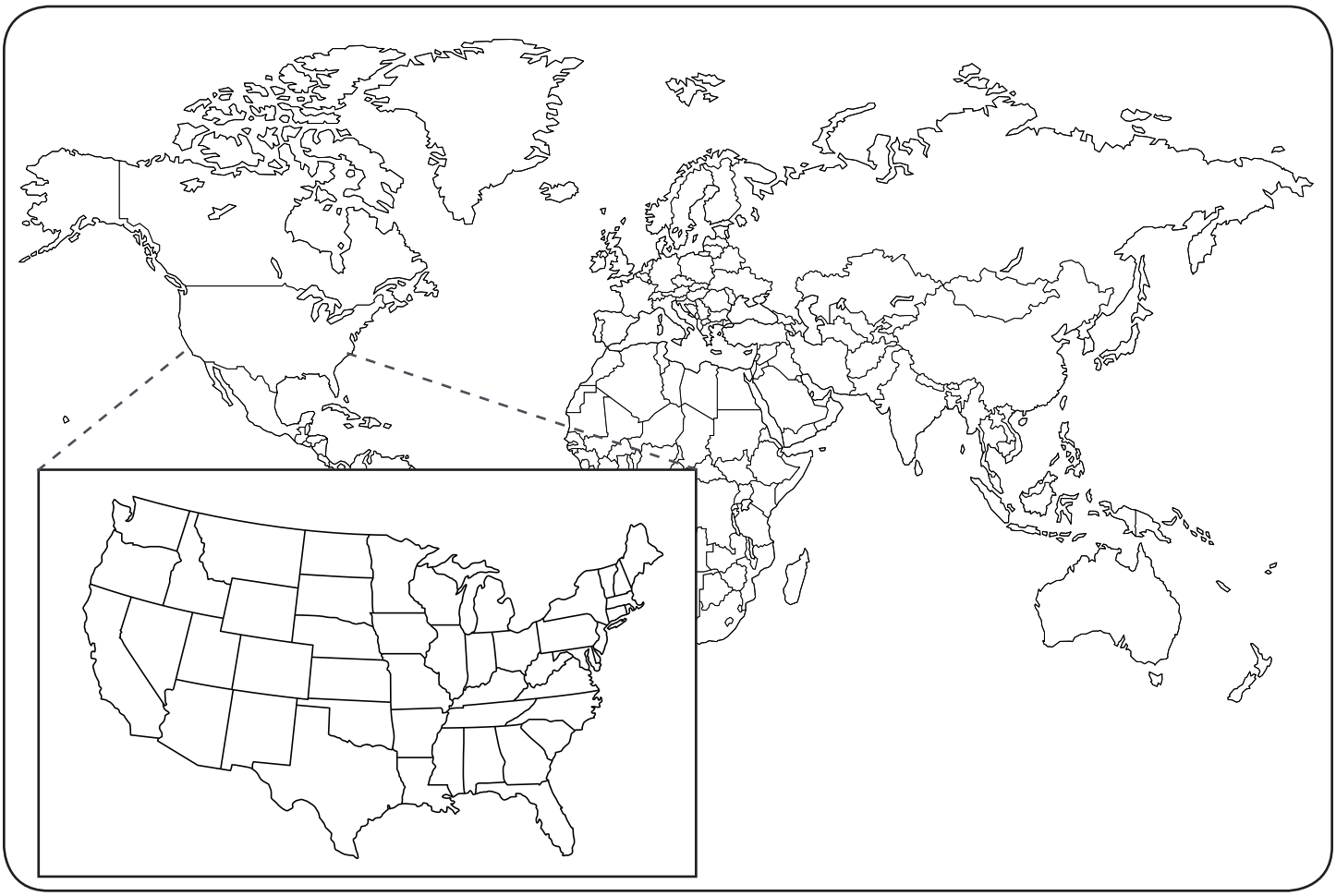
We can't just convert any piece of land into farmland because it may act as a giant 22. _____ or protect a 23. _____ .

One can advocate for more government funding for 24. _____ and 25. _____ protection.

Geography

These countries and places were mentioned in this chapter. Mark their correct locations on the map.
Print this page if necessary.

Chicago	Texas	Russia
Arkansas	Oklahoma	California
Colorado	New Mexico	New York
Kansas	Iowa	Adirondack Mountains



Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. The overall tone of this chapter is
- ☐ a. cautionary but optimistic.
- ☐ b. gloomy and negative.
- ☐ c. approving but pessimistic.
- ☐ d. cheerful and hopeful.

2. What is matched with the correct farmland?
- ☐ a. a grazing animal: rangeland
- ☐ b. a field of watermelons planted in rows: pasture land
- ☐ c. a herd of dairy cows: cropland
- ☐ d. a field of tomatoes: wetlands

3. The authors would most likely agree with which of the following statements:
- ☐ a. The GI bill which provided money for returning soldiers to purchase a home had a negative outcome.
- ☐ b. All proposed transportation corridoes should be fought.
- ☐ c. Because people often only think in terms of short term gains, some government regulation is necessary.
- ☐ d. Houses should only be built on plots of 10 acres or more, as this reduces the amount of concrete and saves woodlots.

4. This chapter can be summed up as
- ☐ a. a story of colonization in the United States and how the government allocated land.
- ☐ b. a discussion about how we relate to land and why it matters.
- ☐ c. a history of wealth in the United States and how people now own airspace.
- ☐ d. a warning against strip malls and why people should not live in suburbs.

5. One reason we are seeing an exponential increase in soil erosion and runoff is because
- ☐ a. planted ground cover helps to stop weeds from growing.
- ☐ b. the soil acts a filtration system.
- ☐ c. labor-saving technologies have been developed which allow for fewer people to farm more acres.
- ☐ d. the increased intensity of rainstorms brought on by climate change.

Investigation and Internet Research

■ Look up some photographs of the Dust Bowl. Do they help show what an ecological and manmade disaster the Dust Bowl was?

■ Investigate farmland protection for your state. (Key words: farmland protection state name) Write down three facts you learned.

■ Look up the most recent Federal Farm Bill. List three facts you learned.

■ What is the smallest plot of land allowed for a new house in your county? (keywords: Zoning commission or zoning board) Is a farmer allowed to sell off ten acres?

■ What is the average price of farmland in your county? If your county has no farmland, then farmland in your state. Compare this price to a subdivision lot.

Writing Focus

1. A family has farmed the same 200 acres for 300 years. It has a 20 acre woodlot of old growth trees. The family plans to sell the trees for lumber as well as ten ten-acre lots. Should the sale be permitted? What are the benefits and negatives? What if cash is needed for medical care? What if the family no longer wishes to farm?

2. Should a farmer be forced to plant cover crops to reduce wind erosion? Or a land owner not be allowed to drain a wetland area? How much regulation is needed? If there is compensation, who pays it and at what price?

3. Explain irreversibility.

Chapter Four

Fact Gathering and Information

Chapter Title: 1. _____ .

In the developed world, we depend on 2. _____ for our food.

Remarkable 3. _____ played a role in bringing about the first agricultural revolution.

Average global temperatures have quickly but nonuniformly 4. _____ in the last 50 years.

5. _____ (incidents of rain, snow, sleet, and hail) are changing, too.

6. _____ predict a warmer future everywhere in the world, as well as rain, snow, and sleet falling in more 7. _____ events with more days between these events.

8. _____ makes the "database" of generational and historical information less valuable.

The harvest rate, or amount of food a crop provides, is known as 9. _____.

Hotter weather shortens the amount of time in a plant's critical 10. _____ phase, thus leading to less harvest at the end of the season.

The amount of 11. _____ a plant can hold changes with temperature.

As global temperatures rise, the carbon that is lost through 12. _____ increases faster than the amount the plant can take it in.

Massive injections of carbon into our atmosphere can reduce the nutritional value of crops, as they develop with 13. _____ .

Although there are some short-term benefits in some places due to climate change, a fifth of the studies summarized by the Intergovernmental Panel on Climate Change predict harvest losses of over 14. _____ by the end of the century.

15. _____ is a human advantage that some of the studies did not take into account.

continued next page

Productivity falls by nearly 16. _____ at 35^0C (95^0F).

17. _____ (about one-third of agricultural gross domestic product) is also vulnerable to climate.

Fossil fuels formed millions of years ago, and when they are burned, they release 18. _____ (carbon dioxide) into the atmosphere.

Carbon dioxide and other 19. _____ thicken and insulate our atmosphere, trapping heat and warming the Earth's surface.

RCPs or 20. _____ project future changes in atmospheric CO2 amounts.

There are stark differences in the scenarios or projections because the future depends on 21. _____ well outside the control of climate science.

Most greenhouse gas emissions come from 22. _____.

Nearly half of emissions from the agricultural sector comes from carbon losses associated with 23. _____ , while a quarter of agricultural sector emissions comes from livestock (particularly cattle).

There is a need for 24. _____ efforts because it is not enough to cut emissions for a few years.

Climate change is more a 25. _____ than a technological one.

Geography

These countries and places were mentioned in this chapter. Mark their correct locations on the map.
Print this page if necessary.

Canada	Tanzania	China
United States	Syria	Indonesia
Costa Rica	India	Brazil
Colombia		

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. The main purpose of this chapter is to
- ☐ a. convince the reader that climate change is real.
- ☐ b. provide an overall explanation of climate change with special attention given to consequences and agriculture.
- ☐ c. discuss how poor farmers in Africa and countries with civil unrest will suffer more than those in countries with wealthy economies.
- ☐ d. explain that climate change is a technological problem with dire consequences.

2. From the graph on page 73, one can tell that
- ☐ a. there will be definitely be more days with temperatures over 90 degrees around the world.
- ☐ b. the low emission projection for the 2050s is equal to the high emission projection of the 2080s.
- ☐ c. days with temperature over 90 degrees in Indianapolis will increase greatly if emissions are high.
- ☐ d. the researchers used city data because temperatures are not measured in rural areas.

3. Why do the authors describe greenhouse gases as Earth's winter coat?
- ☐ a. Just as a winter coat traps in heat and keeps us warm, so do the greenhouse gases.
- ☐ b. Greenhouse gases cause large landmasses to heat up faster than islands in the ocean.
- ☐ c. Greenhouse gases reflect infrared wavelengths year-round.
- ☐ d. Clearing land is akin to taking off one's coat, and the result is more carbon in the atmosphere.

4. The authors list all but what as roadblocks to adaptation?
- ☐ a. civil conflict
- ☐ b. unequal access to new crop varieties
- ☐ c. subsidized crop insurance
- ☐ d. the withdrawal of the US from the Kyoto Protocol

5. What might one do to help chart an alternative, low-emissions future?
- ☐ a. Vote for leaders who enact policy change.
- ☐ b. Insist that every country develop new crop varieties.
- ☐ c. Start planting tomatoes in sandier soils.
- ☐ d. Fight incentive-driven land-based mitigation policies.

Investigation and Internet Research

■ Look up weather patterns for your area and state. How have they changed? How many hot days are you currently experiencing compared to past years?

■ Look up the Intergovernmental Panel on Climate Change (IPCC). Write down three facts.

■ The authors mention David Lobell. Do you think he is a reliable source? Give three reasons why or why not.

■ The US corn belt is mentioned. What states make up the corn belt?

■ Look up Maldives. Explain why this country is especially concerned with climate change.

■ Find maps or charts that show amounts of deforestation in Brazil, Indonesia, or another country.

■ Look up iron and zinc deficiency. List three effects or signs.

Writing Focus

1. Explain why a small scale farmer in Tanzania might be affected more by climate change than you.

2. Explain what might happen to the nutritional value of many crops and the consequence when there is a massive injection of carbon into our atmosphere.

3. Sum up Brazil's practices in the Amazon. Did they practice sustained climate mitigation efforts?

Chapter Five

Fact Gathering and Information

Chapter Title: 1. _____ .

One reason we have avoided the Malthusian trap is 2. _____ .

The first agricultural revolution came with people transitioned from hunting and gathering to 3. _____ _____ around agriculture.

The second agricultural revolution came about due to discoveries from plant sciences, chemistry, engineering, and genetics that generated 4. _____ and _____.

The third revolution, known as the 5. _____ , reduced people experiencing hunger from a billion to 795 million.

The dire prophecies preceding both the second and third agricultural revolutions were stopped by 6. _____

Liebig and Sprengel showed that plants need 7. _____ .

They also argued that plant growth is mainly controlled by the scarcest mineral resource, or the 8. _____ _____ .

Using fertilizer was a great leap forward. After the initial demand was met locally by using human and animal manure, ash, and, bones, 9. _____ was imported from overseas.

As natural sources of minerals declined, artificial 10. _____ were developed, as well as synthetic 11. _____ .

With the understanding of genetics and the passing down of traits, plant breeders developed 12. _____ varieties.

Farm labor is costly, and so when 13. _____ were invented, farmers were eager to use them.

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The 14. _____ was not centered around the environment, but rather expanding agricultural production.
After World War I and II, the solution to avoiding catastrophic famine was a 15. _____ _____ sector.

In poor and undeveloped countries where yields per piece of land were not increasing due to new technologies not being used, farmers expanded 16. _____ by cutting down forests.

Because of specific conditions in Africa and a diverse staple crop, local hybrids still need to be 17. _____.

Most of the early beneficiaries of the Green Revolution technologies were 18. _____ .

When developing "silver bullet" pesticides like DDT, one must watch out for unknown toxicity as well as creating 19. _____ ."

Due to the nutrient-rich 20. _____ , overfertilizing and improper fertilizer application by farmers as well as homeowners with lawns can result in water pollution and algae growth.

Doing away with modern agriculture and going all "organic" would prompt widespread 21. _____ _____ .

22. _____ allows a farmer to target specific fertilizer and pesticide needs even within a single field.

23. _____ can improve how fertilizers and pesticides are released.

GE, or 24. _____ can reduce pesticide usage, be more drought resistant, and have enhanced nutritional value.

In order to make the green revolution greener (protecting our environment and growing food sustainably) we must 25. _____.

Geography

These countries were mentioned in this chapter. Mark their correct locations on the map.
Print this page if necessary.

Peru	Bangladesh	Nepal
Chile	Burma (Myanmar)	Pakistan
Philippines	India	Sri Lanka
Mexico	Indonesia	Thailand

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. The author writes that in 2005, there were 63,000 square miles of lawns in the United States. The author also says this is the same size as the state of Texas. The author compares lawn size to Texas because he wants the reader to
   - ☐ a. realize that agricultural practices are contributing to hypoxia and chemical pollution of the environment.
   - ☐ b. grasp how serious the fertilizer runoff problem is, especially as the water goes directly into storm drains and bodies of water.
   - ☐ c. understand that part of the solution to making a greener green revolution may lie in developing drought resistant grass.
   - ☐ d. be amazed at how much land is not being used for crops, especially as there are people lacking proper nutrition.

2. When Cyrus McCormick got a medal at the 1851 London World Fair it was because his machine
   - ☐ a. used precision agriculture.
   - ☐ b. made farming more efficient.
   - ☐ c. did not require animals to pull it.
   - ☐ d. was the first to use nanotechnology.

3. When the author says that we must innovate, he means
   - ☐ a. we must find alternative food sources.
   - ☐ b. we must study the previous agricultural revolutions.
   - ☐ c. we must make changes, especially by introducing new methods or inventions.
   - ☐ d. we must develop hybrid rice for Asian countries.

4. What is not true about organically grown crops?
   - ☐ a. In general, yields from organic farms are lower than those from conventional farms.
   - ☐ b. Organically grown food commands a premium price in the market.
   - ☐ c. Regular households would not suffer as prices would decrease as supply increased.
   - ☐ d. More natural lands would have to be converted to agricultural lands in order to maintain the food supply.

5. The author's primary purpose in writing this chapter was to
   - ☐ a. insure that the reader understands what a green revolution is.
   - ☐ b. develop a timeline of the discovery, application, and development of synthesized fertilizer.
   - ☐ c. convince the reader that genetically engineered crops are a sustainable solution.
   - ☐ d. provide a broad history of agricultural revolutions and how the next one might progress.

Investigation and Internet Research

■ Many different foods and grains were mentioned in this chapter. Do you know what they look like? Find pictures of the plants as well as what they are harvested for: millet, sorghum, cassava, yam, and cowpeas. Which ones have you tasted? Seen for sale?

■ Find pictures of Cyrus McCormick's reaper, as well as a modern tractor and combine. What does a combine do?What is the price of a combine today? Was the cost in your expected price range?

■ Look up the International Maize and Wheat Improvement Center that was mentioned on page 85. Write down five facts about it that you found interesting.

■ Find information about corn, Vitamin A, and preventing blindness. Is corn high in Vitamin A a GE crop?

■ Find images of people harvesting guano as well as some facts about worker conditions. Write down three things that you found interesting.

■ Look up DDT. Why was it banned?

Writing Focus

1. How did education change the life of the chapter's author?

2. Explain the benefits of precision agriculture. Why isn't it adopted by every farmer?

3. Do the math! How many less people experienced hunger when the amount of people was reduced form one billion to 795 million? Write out the equation (with numbers) that shows how you got your answer.

Chapter Six

Fact Gathering and Information

Chapter Title: 1. _____ .

2. _____ chains are complex systems.

When getting food from farm to fork, the challenge today is finding space in our supply chains that respect one's preferences, needs, circumstances, and the 3. _____ .

The supply chain starts with 4. _____ , such as fertilizer, seeds, and equipment.

Standard farm crop and livestock products are referred to as 5. _____ , which the farmer sells to processors and handlers who transform them into food products, which are then sold to the 6. _____ or food supplier.

Today, due to an increased demand for unique or differentiated products, some features have to be developed 7. _____ the processing stage.

The concentration in the food distribution industry is so high that a small set of 8. _____ have an outsized influence over our food supply.

9. _____ are nutritional content, taste, texture, affordability, and safety.

10. _____ , such as antibiotic free, certified organic, food miles, carbon footprint, welfare production practices, etc, are unseen.

In order to document credence attributes, 11. _____ systems must be in place.

12. _____ is the extra amount of money we will pay for the credence attributes we value.

The 13. _____ (USDA) created a National Farmers Market Directory.

Even though a farmer may get a premium price at a farmer's market, they may not find it worthwhile to sell there due to the cost of packaging, delivering, and 14. _____ spent selling.

continued next page

15. _____ (CSA) programs are direct sale programs that connect farms and producers to a customer base.

16. _____ delivers the cheapest, most secure, and most abundant food supply in the history of humankind.

The large volume of (six items) 17. _____ form the basis of much of the US diet.

Conventional agriculture has freed up large swaths of the population to accomplish goals apart from meeting our 18. _____ .

Conventional agriculture is less physically taxing and allows us to spend 19. _____ on our food.

Planting 20. _____ to prevent erosion and promote soil organic carbon are a sustainable change, but they are costly and the benefits can take years to accrue.

When we buy our food, the price we pay seldom reflects the 21. _____ to the environment or humankind that may be incurred in the production and processing.

Organic sounds sustainable, but without using herbicides, weed control may disturb the soil and release a 22. _____ .

23. _____ (CEA) grows food in indoor set-ups, and often close to cities.

While the potential profit of CEA farms can be high, the operations are 24. _____ , start-up costs are high, and there is a lot of risk.

Each system- organic, local, or conventional- has a cost, but we must come to an agreement on what we need for the 25. _____ of our food systems.

Geography

There are no countries to find for this chapter, but you are not off the hook!
Below or on a separate sheet of paper, put an X in the center of the page to mark your location. Next, look up where the closest ten McDonalds restaurants are. Mark them with circles, placing them in their relative location. Finally, look up the closest Farmer's market or nearest place to local food access. (Use the Local Food Directory.) Mark that (those) location(s) with a square.

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. What attributes are matched correctly?
☐ a. traditional: carbon footprint; credence: color
☐ b. traditional: size; credence: texture
☐ c. traditional: affordability; credence: antibiotic free
☐ d. traditional: food miles; credence: certified organic

2. When McDonalds decides to source chicken that is raised without antibiotics that are important to human medicine, the entire food chain reacts because
☐ a. McDonalds controls a large amount of food sold in the fast food segment.
☐ b. McDonalds is not a chain restaurant.
☐ c. McDonalds favors egg suppliers using alternative housing systems.
☐ d. McDonalds will lose customers due to the need to increase prices.

3. The overall tone of this chapter is
☐ a. biased toward anti-biotic free livestock.
☐ b. dismissive of tracking systems.
☐ c. encouraging to chemical-free producers.
☐ d. respectful of all systems.

4. #2 Yellow corn is grown because
☐ a. the farmer can use the most efficient techniques at hand to grow as much food as is profitable per square foot of land.
☐ b. it can be grown without using herbicides and thus has a lower impact on the environment.
☐ c. it has been genetically modified to produce a higher protein content.
☐ d. buyers can choose the producer offering the corn at the lower price.

5. Refer to the graph on page 105 for this question. Most likely, the reason for the number 155
☐ a. is controlled-environment agriculture.
☐ b. is conventional agriculture.
☐ c. is organic agriculture.
☐ d. is community supported agriculture.

Investigation and Internet Research

■ Look up #2 yellow corn. Write down two facts.

■ Go to the USDA website. Write down who founded it and one other fact you find interesting.

■ Look up the product Soylent (it is a drink.) Does its supply chain involve farmers? Has its supply chain ever been interrupted?

■ Look up an explanation for Futures Market. Would you be interested in being a trader?

■ Look up images of AeroFarms.

Writing Focus

1. How do you think online shopping will affect locally grown or produced food? (There is no right or wrong answer here, but you have to explain your reasoning.)

2. You're the mayor. A CEA wants to move into an abandoned building. Do you give them a tax break to start? Defend your answer.

3. Explain how aviary houses are an example of the complexities we face with respect to the design of our food system.

Chapter Seven

Fact Gathering and Information

Chapter Title: 1. _____ .

123 countries established the 2. _____ (WTO) in 1995.

The Global Trade Analysis Project (GTAP) measures the impact of international trade agreements on (4 items) 3. _____ .

GTAP showed that for most countries, the 4. _____ would be large enough to offset the likely losses.

The increased 5. _____ that has come from global trade has increased our standard of living.

The Nobel Peace Prize was awarded to Cordell Hull, who argues that countries trading with one another are 6. _____ .

In the case of the 7. _____ (NAFTA), US corn producers were winners, but the opposite occurred in the case of manufacturing.

Although global trade may have some negative consequences, we need it to ensure 8. _____ _____ .

Statistics on (2 items) 9. _____ help us measure the importance of international trade.

In 2011, nearly 10. _____ of US crops were exported, an amount that is far more than any other broad sector of the American economy.

According to George Box, the Simplified International Model of agricultural Price Land (SIMPLE) model may be wrong but 11. _____ .

The tripling of global crop output from 1961 to 2006 was unprecedented and due to three important forces: 12. _____ .

continued next page

The projected growth in global crop output from 2006 to 2050 is expected to be only half as fast due to 13. _____ .

It is estimated that by the mid twenty-first century, for the first time in history, 14 _____ will become a more important driver of global food demand than population.

15. _____ are protected in many countries due to the reluctance to rely excessively on imports and to ensure adequate food during times of war and shortage.

Instead of being taxed, producers are provided with 16. _____ .

Once a country has begun subsidizing its farm sector, the next step is to 17. _____ .

The importance of 18. _____ cannot be overemphasized because they are the only factors pushing back against the natural tendency to restrict farming imports and freeze the current pattern of production.

The 19. _____ (TRQ) system is a means of regulating trade while avoiding the use of import quotas.

With TRQs, when a certain level of "in-quota" imports is reached, the 20. _____ (a tax or duty to be paid on a particular class of imports or exports) jumps to a higher level.

Agricultural production is different from producing specialized manufactured goods because it requires (two items) 21. _____ .

22. _____ gives us an important buffer against unforeseen weather events.

Without ways to stop 23. _____ , the world is in for a rough ride in an era of increasing crop supply shocks due to climate volatility.

We need 24. _____ in our labor markets.

This means we must invest in 25. _____ by providing training for new jobs and investing in our education system.

Geography

When the WTO became established, 123 countries came to agreement around international trade. Without looking at any resources, try to fill in 123 country names on the map, regardless of whether they are part of the WTO or not. *Print this page if necessary.*

To start, and as a hint, you can find and mark these countries mentioned in the chapter:

Switzerland	Mexico	Korea	Brazil
Uruguay	Mozambique	New Zealand	India
Japan	Canada	Vietnam	Australia
China			

How close to 123 did you get? _____

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. What is not an example of agricultural protectionism?
☐ a. banning rice imports
☐ b. disallowing imports of GMOs (genetically modified organisms)
☐ c. high tariffs on sugar imports
☐ d. accepting food aid

2. Most likely, in 2050, the author feels that the circle graph on page 123
☐ a. will remain the same.
☐ b. will show Asia having 52% of the current share of international crop purchases.
☐ c. will show Canada and the US decreasing their international crop purchases down to less than 1%.
☐ d. will show Africa having 28% of the current share of international crop purchases.

3. The main purpose of this chapter was to
☐ a. discuss benefits of international trade.
☐ b. explain how and why the WTO started.
☐ c. show support for tariffs and quotas.
☐ d. convince the reader that trade is very contentious.

4. Why does the author suggest that divorcing health care and retirement benefits from employment might make workers more flexible?
☐ a. When people are divorced, they often find themselves with less income.
☐ b. Companies have trouble finding workers when they offer good retirement benefits.
☐ c. Workers would have less fear of switching jobs because they would not lose critical benefits.
☐ d. Universal health care is already in place, so companies no longer need to offer it.

5. Why aren't Thomas Friedman's words, "the world economy is flat," completely true when it comes to the global agricultural economy?
☐ a. Agriculture production requires suitable land and climate, factors that cannot themselves be produced.
☐ b. No countries are dominant when it comes to agricultural production.
☐ c. Severe weather events can create major crop losses.
☐ d. The world economy is highly competitive when it comes to specialized manufactured goods.

Investigation and Internet Research

■ Go to the WTO website. How many countries are in the WTO today? Write down two other facts you find interesting.

■ List some tariffs the US (or your home country for those students reading this book outside of the US!) have imposed over the years or currently. Can you find out when the first tariff was set?

■ You go to a foreign country and buy 1,000 dollars worth of goods to bring back for personal use as well as gifts for other people. Do you have a pay a tariff or a duty tax when you return to the US? (Hint: To start, go the US Department of Homeland Security, US Customs and Border Protection website and type in Customs Duty Information.)

■ Find out when Congress enacted the first tariff against foreign produced sugar.

Writing Focus

1. Explain farm subsidies. What are they? Why and how did they start?

2. Why, in the case of processed food, has potential trade been supplanted by foreign direct investment?

3. Do you think the US should be part of the WTO? There is no right answer, as it is your opinion, but you must defend your answer.

Chapter Eight

Fact Gathering and Information

Chapter Title: 1. _____ .

The long and complex 2. _____ starts from when the farmer plants the seed or breeds livestock to when a person takes a bite out of food.

3. _____ is when loss occurs from planting time up to and through harvest time.

4. _____ is when there is food loss along the storage, processing, and transportation part of the supply chain.

Harvest loss and postharvest loss make up the entirety of 5. _____ .
Food loss occurs in the 6. _____ of the supply chain.

7. _____ happens at the end of the supply chain

8._____ (EPA) estimates that food waste in the US is the largest single component going to municipal landfills.

In 2010, the year's worth of calories from food waste in the US amounted to enough calories to feed more than 9. _____ for a day and had a purchase value of $162 billion.

Not all food should be 10. _____ .

To be 11. _____ means that a household faced difficulty at some time during the year in providing enough food for all household members.

Developed countries experience a higher prevalence of food waste, whereas developing, poorer countries suffer more from 12._____ .

A general attitude is related toward food waste, but access to 13. _____ is related to food loss.

continued next page

Higher-quality harvesting, better transportation systems, and more effective storage systems means less food loss during 14. _____ .

We must become aware of the food waste and then intend to do something about it because we are far, far above the 15. _____ of food waste.

Unlike the dates for infant formula, many sell and use by food dates are not 16. _____ ; the sell by date is set by food manufacturers as a guide to retailers.

Some GMO crops- the FLAVRSAVR tomato, for example- can reduce food waste, as they have a gene inserted that stops production of an 17. _____ that causes the tomato to soften and rot.

In 18. _____ , the nonuniform "ugly" produce can be processed into juice and jam.

Retailers donating to foodbanks may get a 19. _____ .

Composting is a 20. _____ , meaning it has the potential to handle a growing amount of work.

When farmers don't have access to storage technologies, they can sell their crop for a low price at harvest or store it and suffer huge losses due to 21. _____ .

All over the developing world, losses to insects range from 22. _____ .

23. _____ means airtight storage.

A 24. _____ (PICS) bag is a triple-layer heavy plastic bag that can be squeezed down to whatever amount is available.

When one thinks of the effort and depletion of soil and water that goes into farming, one can see that food waste and food loss harms the 25. _____ .

Geography

These countries were mentioned in this chapter. Mark their correct locations on the map.

United States	India
Canada	Mali
Australia	Ethiopia
New Zealand	Democratic Republic of the Congo

Mark with an X the 4 countries most likely to suffer food loss rather than experience food waste.
Print this page if necessary.

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. What is an example of food waste?
☐ a. a discarded half-eaten orange
☐ b. corn dropped by the harvester
☐ c. lettuce rotted due to a faulty refrigerator truck
☐ d. wheat eaten by locusts

2. The main idea of this chapter is to
☐ a. define food loss and food waste by providing examples.
☐ b. discuss a solution to food waste.
☐ c. explain what happens to uneaten food and potential ways to deal with it.
☐ d. argue that with less food spoilage there will be no food insecurity.

3. Why is hermetic storage so important?
☐ a. It prevents harvest loss.
☐ b. Insects can't get in, and those that are in are asphyxiated.
☐ c. It increases the rate food can be composted.
☐ d. It allows the farmer to sell his grain at harvest time.

4. When looking at the graph on page 137, one can see that in the supply chain,
☐ a. South and Southeast Asia suffer a far greater food loss during distribution than does North American and Oceania.
☐ b. North America and Oceania have a far greater amount of food waste than South and Southeast Asia.
☐ c. South and Southeast Asia suffer a smaller percentage of food loss during storage than do North America and Oceania.
☐ d. North America and Oceania suffer equal amounts of food waste when adds ag production and storage losses together.

5. What is it about PICS bag that makes it scalable?
☐ a. The bag has a triple-layer of heavy plastic.
☐ b. The bag can hold up to 100 kilograms of cowpeas.
☐ c. The bag is like a composter in that it is used for digesting food.
☐ d. The bag can be squeezed down so that it fits exactly the amount of available crop needing to be stored.

Investigation and Internet Research

■ Look up a PICS bag demonstration from Uganda on YouTube.

■ Look up FSIS and find information about food product dating. Write down three things you find new or interesting.

■ Look up some images of misshapen fruits or vegetables. Would you buy them? Feel comfortable eating them?

■ Look up the food digester in Yaphank, New York. Write down three pieces of information about it.

Writing Focus

1. Describe the FLAVRSAVR tomato and then tell if you think it should be served in school cafeterias around the United States.
Your decision to serve or not will not be wrong, but you must defend your reasoning.

2. Explain what the author meant when he wrote, "The end result is that those who need the food the most will lose it. And those who have it, will waste it."

3. Think back over the last three days. Describe some or all of the kinds and amounts of food you have or have seen by others being discarded.

Chapter Nine

Fact Gathering and Information

Chapter Title: 1. _____ .

Health effects due to 2. _____ have a real and lasting impact on communities, on nations, and individuals today and across future generations.

In feeding the world, it is not enough to simply have the 3. _____ available.

The challenges of 4. _____ when there is access to food is different from those who don't have access to it at all.

An economic decision-making framework is: do something if 5. _____ .

All 6. _____ involve benefits, costs, and trade-offs.

7. _____ refers to more than money. It includes things like time, mental effort, and social costs.

8. _____ must be made efficient.

9. _____ (or increasing marginal efforts) is when as you continue to exert effort on some activity, the returns from that activity begin to decline.

When it comes to diet plans, remember to do something only when the 10. _____ .

Processed foods are hard to give up because taking them out of your diet will decrease the "reward" (good feeling after you eat) in your diet, and they are 11. _____ .

To create a health-oriented, efficient food plan, one must focus on the most important factors of being healthy because with modest effort we can 12. _____ .

13. _____ in improving health, such as eating to reduce obesity, are those that yield the biggest and most robust benefits.

continued next page

The 14. _____ roughly says that if you have multiple competing theories, go with the simplest one.

The concept of robustness makes two points, the first being that a theory or dietary philosophy is robust of it is supported by numerous 15. _____ .

The second point is that a theory or dietary philosophy is robust if it 16. _____ _____ to every last detail to be effective over the long run.

One of the most robust and simple theories of weight loss is the 17. "_____" theory.

We evolved as a species to 18. _____ rather than to avoid them.

19. _____ has to do with how good food tastes.

A change in 20. "_____ " usually refers to the increased availability of manufactured or processed products (unnaturally good-tasting foods).

Manufactured foods engineered to have increased palatability and to increase sales have unnatural combinations of 21. _____.

22. _____ is related to satiety (feeling sated or full) because foods that tend to have low calorie density also tend to be more filling.

The three things that maximizes benefits while minimizing costs for the average person are to 23. _____ _____ , eat calories rather than drink calories, and 24. _____ to increase the feeling of fullness and to preserve lean mass.

One should look at their target weight and then 25. _____ , adopting a food lifestyle and exercise regime that is consistent with that end goal.

Geography

On a separate piece of paper or in the space below, mark your current location and then draw a line to a real-life location (your home, a gym, a store, a beach) that is less than 25 miles from where you are. Use google maps to calculate a more exact figure for the distance. Then, use a calorie counter (several are available on the internet) to figure out and write down how many calories you would burn walking or biking there.

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. In the sentence on page 151, "Nutrition advice is often based on scientific studies conducted by researchers trained to think about minutiae rather than the practical challenges that people face on a day-to-day basis," the word minutiae most likely means
☐ a. minute by minute decision making.
☐ b. theoretical.
☐ c. the small, precise, or trivial detail of something.
☐ d. the global perspective, or big picture.

2. Most likely, what statement would the author most agree with?
☐ a. Nutrients tend to take care of themselves if one eats food from nature rather than processed foods.
☐ b. One's goal should be great physical fitness, as exercise burns up calories.
☐ c. No one should ever eat a candy bar as it has been engineered to be unnaturally good-tasting.
☐ d. Because it reduces the number of calories in, crash diets are efficient ways to reduce obesity.

3. What food is most likely to have the greatest calorie density?
☐ a. potato chips
☐ b. apple slices
☐ c. carrot sticks
☐ d. orange sections

4. Why might the author suggest that the vegan diet is a poor diet?
☐ a. It does not include fresh fruits and vegetables.
☐ b. The diet calls for an excess amount of processed foods.
☐ c. It is too robust.
☐ d. The time and social costs are too high.

5. When the author writes that "achieving 95 percent makes no sense at all," he means
☐ a. that one should always try for 100 percent.
☐ b. that moderation is not enough.
☐ c. that the costs are outweighing the benefits.
☐ d. that there is no optimal way to eat healthily.

Investigation and Internet Research

■ Look up the amount of sugar in a can of mountain dew. How many apples could you eat instead? Boiled eggs? Celery?

■ The author mentions Occam's razor on page 156. Look up Occam's razor. Write down a simple definition. (If you want, you can listen to Merriam Webster's Word of the Day podcast on 3/29/2017).

■ Take a guess at two of the most overweight countries and two of the least overweight countries. Then, look up those categories on line and see if the countries you guessed are mentioned.

■ Go to Amazon and type in diet books. Why might someone be unsure of what to buy?

■ Pick a food. Then find an article that pushes consumption of that food. Now try to find an article that refutes the first or says something different. Write down the title of each article or copy the http number.

Writing Focus

1. Your friend is going to go on a low carb diet. Should they? Tell why or why not. Your answer will not be wrong, but you must defend it.

2. Is it necessary to eat GMO-free foods to reduce obesity? Explain.

3. Alan Aragon (page 163) advises one to act like the person you want to be. Explain what he means. Then come up with some incremental steps you can take.

Chapter Ten

Fact Gathering and Information

Chapter Title: 1. _____ .

Due to 2. _____ exercising discretion, McDonald's buys pork from farmers who practice group housing rather than 3. _____ .

In addition to legal licenses, there are also 4. _____ licenses.

Social licenses to operate are 5. _____ and _____ based on concepts, values, tools, are practices that represent a way of viewing reality for an industry and its stakeholders.

At one time, 6. _____ were the primary driver of decisions, but social licenses to operate adds a new dimension to acceptance.

Our ability to influence decisions and control social licenses is both a 7. _____ and a _____ .

Using our power to revoke and grant social licenses to operate carries 8. _____ .

In one remains too stubborn in the righteousness of their beliefs, our capacity to feed the world may become 9. _____ .

Food represents 10. _____ symbols which vary across cultures and regions.

Food is something far more than a means of sustenance as it has become an indicator of 11. _____ and _____ and of 12. _____ and _____ systems.

Although much of our direct involvement in food production has 13. _____ , for many the interest has been reallocated to 14. _____ .

The role of animals that elicits the most debate is when animals are 15. _____ .

continued next page

For many, eating animals classified as 16. _____ is more acceptable than eating those they classify as pets.

One may be more willing to eat an animal if one has no 17. _____ to it.

To stay in business today, livestock producers must meet required legal standards as well as the regulations of their 18. _____ .

Traditionally, interest groups pursued change through 19. _____ , but now they are pursing change through the 20. _____ , too.

When people refused to buy milk with rBST, milk producers were "forced" to adjust their production practices to meet the 21. _____ of their customer.

Wealthy consumers may be blind to the fact that their demands will raise the price of food, thus drastically raising the 22. _____ of a poor person.

As perceptions of animals differs around the world, it can 23. _____ because it spills over into 24. _____ negotiations.

Our position on food production can yield positive advances, but the challenge is to 25. _____ .

Geography

It was mentioned in this chapter that horses, dogs, cattle, and pigs are commonly eaten in some countries and not in others. Mark on the map with an H, D, C, and P a few countries where these animals are commonly consumed. *Print this page if necessary.*

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. When one uses the phrase "politics practiced through the market," one means that
- ☐ a. one's vote can be bought.
- ☐ b. one is pursing political change by what one buys.
- ☐ c. one is choosing to make a legislative change.
- ☐ d. one is not voting with their money.

2. If one had to sum up this chapter in one line, one might say,
- ☐ a. "It is about eating pets versus livestock."
- ☐ b. "It is about how social licenses can affect markets."
- ☐ c. "It is about McDonalds pleasing its customers."
- ☐ d. "It is about the importance of food security."

3. One negative consequence of prohibiting all consumption of dog or horse meat might be
- ☐ a. less people keeping pets.
- ☐ b. lower prices for beef and pork.
- ☐ c. an increase in insect consumption.
- ☐ d. financial stress on a poor farmer.

4. Our ability to influence decisions and control social licenses is both a right and a privilege, but it is a
- ☐ a. challenge because we don't see things the same way.
- ☐ b. responsibility that many do not take seriously.
- ☐ c. requirement that makes drastic demands on the poor.
- ☐ d. duty resting solely on those registered to vote.

5. An example of a social license to operate might come from
- ☐ a. people voting to enact new government regulations.
- ☐ b. people reading books with photographs of soybeans.
- ☐ c. people only buying eggs from free range chickens.
- ☐ d. people using sniffer dogs at airports.

Writing Focus

1. You decide to do a semester abroad in your junior year. The very first night at your host family in Peru, they have prepared a special dinner for you- guinea pig. You once kept guinea pigs as pets. Write a paragraph where you first explain the situation and how you handle it.

2. Explain the difference between a legal license and a social license.

3. Dogs should never be eaten. Write a paragraph or two defending or attacking this statement.

Investigation and Internet Research

■ Look up gestation crates. Describe a typical size and how they are used. Do you live in a state or country with restrictions on them?

■ The author states that most children can draw a chicken but not a soybean. Draw what you think a soybean looks like, then next to it draw a picture of a soybean after you look it up on the internet. Now ask a student outside of the class to draw a soybean. What did they come up with?

■ The author states that food has become a status symbol. Look up five very expensive food items. What are they? How much do they cost? Have you ever tasted them?

■ The author says that use of the improper fork may be perceived as a signal of lack of prestige or class. Draw a table setting for a formal dinner and label what is what.

■ Look up five revolting or disgusting foods. Who decided the food is revolting or disgusting? Is it portrayed in a way that is disrespectful to a different culture? Rewrite the description in a way that does not impose one's own values.

Chapter Eleven

Fact Gathering and Information

Chapter Title: 1. _____ .

The right course of action is not 2. _____ .

3. _____ informs our decisions.

Communication around 4. _____ is not yet as good as we need it to be.

Today, one single farmer can feed 5. _____ , and less than 6. _____ of the American population works in agriculture.

The communication challenge between the general public and agriculture intensified with the advent of the 7. _____ and the rise of the 8._____.

On the Internet, one can portray any issue they want to their 9. _____.

The food movement denotes people who are engaged or interested in their 10. _____ .

11. _____ was slow to engage and slow to take people's concerns seriously.

The reaction to 12. _____ and his increased lamb size shows that contentious communication around agricultural issues is not new.

Due to how the issue has been misrepresented, many people fear that that 13. _____ are not safe to eat.

The Internet makes it too easy to pick up sound bites, images, or solitary articles that boil an issue down to a 14. _____ .

The ways in which scientific discoveries are communicated may have massive 15. _____ .

16. _____ , such as those used by Facebook, create an echo chamber of our own opinions, showing us what we "want" to see.

continued next page

17. _____ techniques have created a segment of the population that is nervous and fearful toward the food and agricultural industry, and vice versa.

The goal is communication that begets more reliable information and communication that aids us in 18. _____ .

The first thing one can do to achieve this goal is to 19. _____ .

The second thing one can do is check out the 20. _____ .

Third, don't become overinvested in 21. _____ .

Fourth, don't always trust 22. _____.

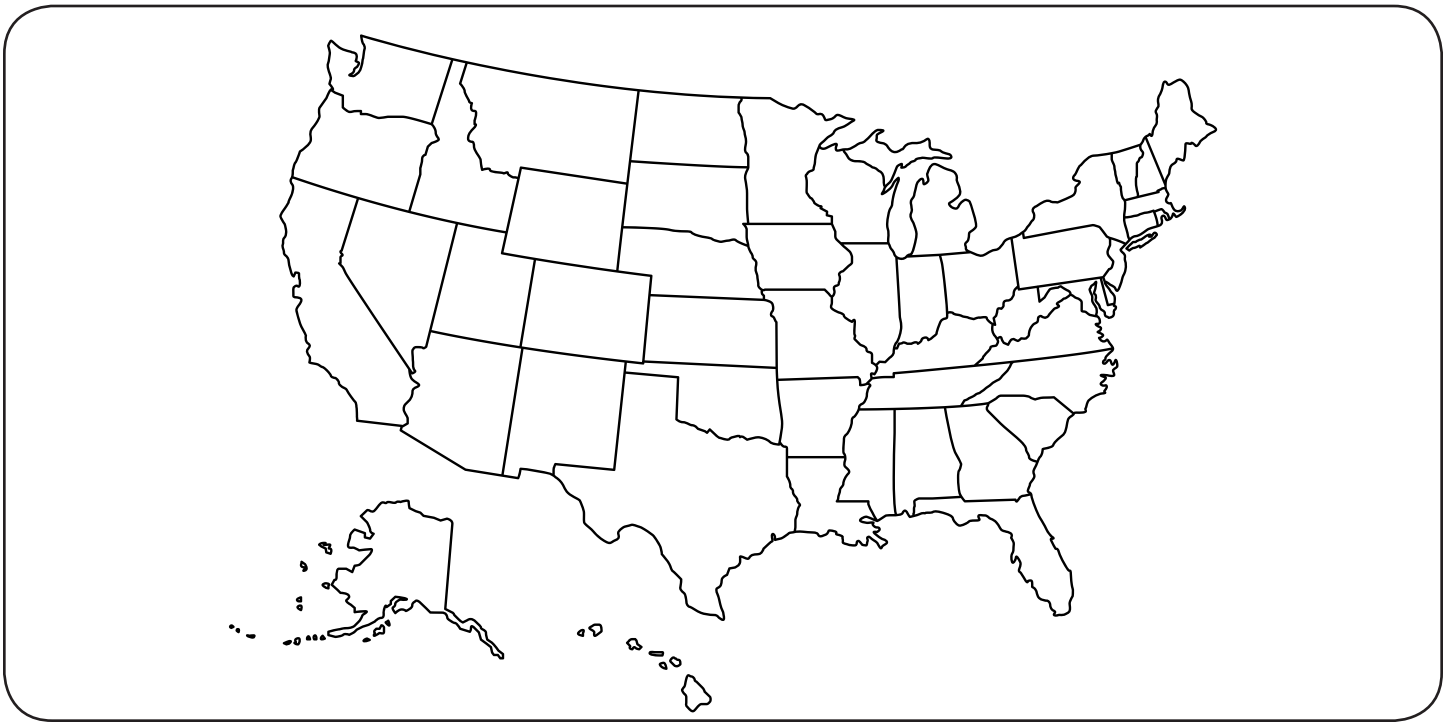
Fifth, remember that being 23. _____ does not make one an expert about food security.

Sixth, beware of anything that openly attempts to 24. _____ .

Communication is the 25. _____ upon which decisions, both good and bad, rely.

Geography

How much of 4th grade can you remember? Find and mark South Dakota and other states that make up the Great Plains on the map. Try first and then check and correct your answers by looking up Great Plains on the Internet.



Investigation and Internet Research

■ Look up the Pacific Northwest Tree Octopus. How might your reaction differ from one not carefully checking sources?

■ Find egg price data for five different times.

■ Check your newsfeed on your phone or computer. Were the posts you were shown similar to items you posted or "liked"?

■ Type in GMOs, click the image bar and describe one negative image and one positive. Which "side" had more images? What was the most "untrue" image you saw?

■ Look up battery cage vs. cage-free eggs. How do the images make you feel? How hard was it to find an informative dialogue?

■ Look up Robert Bakewell. Write down three facts you find interesting.

Writing Focus

■ The author talks about sound-bites. Write two tweets (not more than 280 characters). The tweets must be on the same subject, but one should be pro, while the other is con.

■ Write a paragraph or two where you explain if agricultural scientists are "playing God" the same way Robert Bakewell did. Defend your answer with reason and not emotion!

■ Write a paragraph or two about California's 2008 Proposition Two. How would you have voted? Why? How might one insure that low wage-earners could afford protein?

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. Most likely, when one looks up GMO foods on the internet and sees a syringe sticking out the side of a fruit, the image was posted by
☐ a. someone famous.
☐ b. someone using anecdotal evidence.
☐ c. someone with a reliable source of information.
☐ d. someone trying to manipulate your emotions.

2. The author brings up the 2015 egg prices to
☐ a. defend the practice of caging chickens.
☐ b. bring attention to the avian influenza epidemic.
☐ c. push for a wage increase for California's lowest wage earners.
☐ d. show how some regulations put undue burden on the poor.

3. In the sentence, "To be clear, contentious communication around agricultural issues is not new," the word contentious means
☐ a. checked for incorrect information.
☐ b. reviewed by a reliable source.
☐ c. causing or likely to cause an argument.
☐ d. backed by scientific data.

4. What answer is most likely not part of the food movement?
☐ a. an attempt to provide fresh fruit in school cafeterias
☐ b. city regulations for bicycle paths
☐ c. an inquiry into the amount of plastic needed to package food
☐ d. the use of certain pesticides

5. One can conclude from this chapter that the author
☐ a. is angry about how GMOs have been misrepresented.
☐ b. is hopeful that different interest groups can understand each other.
☐ c. is against the Internet and the food movement.
☐ d. is despairing of every reaching world food security.

Chapter Twelve

Fact Gathering and Information

Chapter Title: 1. _____ .

When one eats a 2. _____ , one may fail to obtain sufficient protein and micronutrients for robust health and physical growth.

Because much of the brain's capacity and structure are determined by age three, and the brain's development is correlated with a child's outward physical growth, 3. _____ is used to measure malnutrition.

Due to critical time periods when brain systems are developing, reducing malnutrition is often targeted at children during the 4. _____ .

Some researchers have suggested that ridding the planet of 5. _____ deficiencies would raise the world's IQ by ten points.

Although caregivers can sometimes compensate for lack of good nutrition, 6. _____ is extremely difficult and diminishes over time.

7. _____ driven by early malnutrition tends to perpetuate itself across generations.

A common myth is that malnutrition reflects 8. _____ .

One must have enough food, and the 9. _____ of food.

A second misunderstanding is that food insecurity arises from widespread 10. _____ .

Acutely hungry people need 11. _____ or _____ .

12. _____ occurs when people cannot obtain a consistent supply of essential nutrients.

Recent food famines and food crises can be traced to 13. _____ .

The problem confronting the majority of hungry or malnourished people is either 14. _____ _____ or 15. _____ to obtain food, or both.

continued next page

16. _____ are areas where budgets are tight and options to buy healthy and fresh foods are limited.

In urban food deserts of high-income countries, problems such as obesity, heart disease, and diabetes, arise from consumption of 17. _____ .

A 18. _____ is the proportion of a dollar of income that a family spends on some category of purchases.

19. _____ refers to people shifting from inexpensive diets low in calories and nutrients toward diets higher in calories and then more costly diets that are more 20. _____ _____ .

21. _____ data measure how much food is available to people living in a particular country at a particular point of time.

Rising incomes and rapid innovations in agriculture are factors that help explain the 22. _____ over time.

Worldwide nutrition transition will place a 23. _____ on agricultural systems and the natural systems on which they depend.

24. _____ argues in favor of policies that focus on influencing the production, marketing, and availability and affordability of foods.

Data collected by MODIS shows that 25. _____ are correlated with the "green" satellite signal.

Geography

These countries were mentioned in this chapter or part of a graph. Mark their correct locations on the map.
Print this page if necessary.

Nepal	Denmark
United States	Mexico
Japan	India
Egypt	Malawi
Democratic Republic of Congo	

Investigation and Internet Research

■ List five countries that spend the least amount of their budget dollars on food and five countries that spend the most (hint: keywords: food budget dollars different countries) Write down the amount next to the country, and the year the data was taken from.

■ Look up foods high in iron, zinc, and iodine.

■ Look up symptoms for iron, zinc, and iodine deficiencies. (You may have already looked up symptoms for iron and zinc as an Internet Research question for Chapter Four.)

■ Farmers in Nemat's village in Nepal grow mostly corn, potatoes, and wheat. Where did these three food crops originate?

Writing Focus

■ Explain why childhood nutrition is so important. Your answer should detail three points.

■ Why were food prices more important to American consumers in 1917 than they are to average Americans today?

■ Define an urban food desert. Propose a way(s) to help prevent one.

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. The main point of this chapter is to
☐ a. discuss how equal access to the right food is needed.
☐ b. explain why there is not enough food to feed the world.
☐ c. show how micronutrients can increase IQ.
☐ d. prove that war and armed conflicts harm children.

2. According to the graph on page 197,
☐ a. Malawi has a higher budget share for food than the Democratic Republic of Congo.
☐ b. the United States has a higher budget share for food than Mexico.
☐ c. Denmark has a lower budget share for food than Egypt.
☐ d. India's budget share on food is close to China's, but India spends more on beverages.

3. One reason there are chronically malnourished people in the world is because
☐ a. there are insufficient food calories produced each year.
☐ b. people don't have land to grow food or money to buy it.
☐ c. the majority of people are not aware of the need for micronutrients.
☐ d. most food banks are located in wealthy countries.

4. What helps makes the author optimistic about global food security?
☐ a. sustainable restaurants
☐ b. the World Health Organization (WHO)
☐ c. nutrition transition
☐ d. technology

5. If someone is obese and suffering from diabetes,
☐ a. they might be living in a food desert.
☐ b. they are likely from Nepal.
☐ c. they most likely live in an area of armed conflict.
☐ d. they are from an area with low-calorie availability.

Conclusion

Fact Gathering and Information

Book Section: 1. _____ .

The challenges presented in the book are complex in their own right, but they are also 2. _____ .

The growing population spills over into 3. _____ impact.

With growing numbers, we no longer have the luxury of using land and water in ways taken for granted by 4. _____ .

Water and land are 5. _____ (or limited) resources, and water is not 6. _____ distributed.

Once farmland is 7. _____ through human activities, it is extremely difficult to reclaim it.

There is an interplay between 8. _____ and agriculture, with farmers having to adapt.

9. _____ is what enabled us to feed today's population, and it remains 10. _____ to developing more sustainable farming innovations and smarter food production methods.

Our 11. _____ are complex and diverse, with food arriving at our plates in different ways and in different forms.

Farmers may choose to grow certain crops because there is an ideal 12. _____ between soil, climate, equipment, and abilities.

International trade plays an important role when it comes to 13. _____ .

14. _____ is a buffer against unforeseen weather and economic events.

15. _____ , an unplanned decision made by a well-fed nation of people, happens at the very end of the food supply chain.

16. _____ happens throughout the food chain and is desperately fought by farmers.

continued next page

Food is one of the primary contributors to our 17. _____ .

18. _____ is on the rise, and so are the related health problems that come with it.

The problem of what one should choose to eat can be evaluated using an 19. "_____ ."

As a society, we have the capacity and power to grant and revoke 20. _____.

With that power, comes the ability to do great things and/or 21. _____ .

There are problems with our current state of 22. _____ around food and agriculture, but there are also solutions that enhance our flow of knowledge.

The ultimate challenge is achieving 23. _____ to food.

The problems in this book are tough but 24. _____.

Everyone can help, whether 25. _____ or old.

Geography

The *six degrees of separation* concept posits that any two people on Earth are six or few acquaintance links apart. Think about all the food and food supply chains you are connected with- what you eat, how you get it, who you share it with. Now mark six countries that you definitely are linked to when it comes to food at the level at or below six degrees of separation.

Next, mark six countries you are least likely to be linked to. Is this possible?
Print this page if necessary.

Investigation and Internet Research

■ Look up two contributors (pages 235-239) and write down two facts about them that are not found in the paragraph describing them in the book.

■ Go through the Notes (pages 221-233) and choose one journal or book cited as a source. Look up the source. Does it seem legitimate? Why or why not?

■ Find an article about new issues or technologies in agriculture. Sum it up in two sentences.

Writing Focus

1. A lot of different jobs or occupations were mentioned in this books that all have a part in insuring global good security. For example, meteorologist, inventor, seed developer, communicator, etc. Out of all the kinds of work and jobs mentioned in the book, what type of work most sparked your interest? Write a paragraph describing some of the things you think the job entails and why it interests you.

2. Did the book have an impact on you? What part surprised and/or interested you the most? Would the book have had the same impact if it had been written in a threatening tone vs a challenging one?

3. In the introduction, one is told that no one was paid to contribute to the book, and that no one's research was funded as a result. Does knowing that affect how you feel about the book? Why or why not?

Critical Thinking Practice, SAT Preparation, and Assessment

Remember: *Some of these questions will involve thinking critically about information you learned in the chapter. Read every answer choice!* Choose the correct answer, eliminating the ones you know to be incorrect.

1. When one puts down this book, the authors intend for the reader to feel
☐ a. fearful of the continuing trend of population growth.
☐ b. concerned about the lack of respect toward others beliefs.
☐ c. interested in studying agricultural technology.
☐ d. optimistic and capable of engaging in change.

2. What did the authors want to convey when they wrote that it is easy to glibly suggest that farmers grow something else?
☐ a. One is speaking cautiously, as one has no idea of what the impact will be on international trade.
☐ b. One is speaking carefully, as farmers have unique abilities that are not easily transferred.
☐ c. One is speaking thoughtlessly, as the crop grown may ideally match the soil, climate, and equipment where it is grown.
☐ d. One is speaking hastily, as one has not been told at what latitude the farmers are located.

3. What might be covered in a follow-up chapter to this book?
☐ a. a lesson on negotiating techniques
☐ b. the history of China's policies to control population growth
☐ c. religious objections to gene splicing
☐ d. technologies that allow seeds to grow at accelerated rates

4. What proverb or saying best matches the main point of the conclusion?
☐ a. No man is an island.
☐ b. You catch more bees with honey than you do with vinegar.
☐ c. All's well that ends well.
☐ d. Common sense is genius dressed in its working clothes.

5. What is not true about trade?
☐ a. It can help maintain prices so that farmers are more diligent in harvesting their crops.
☐ b. It can repair soil damaged by the effects of global warning.
☐ c. It has potential for reducing the amount of food that is wasted or lost.
☐ d. It can help keep perishable crops from piling up in storage where they may spoil or are eaten by insects.

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