

**CAREER  
PATHS**

# Agriculture

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Express Publishing



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**CAREER  
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# Agriculture

Book  
**1**

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## Scope and sequence

Unit	Topic	Reading context	Vocabulary	Function
1	History of agriculture	Textbook Passage	agriculture, produce, plant, crop, harvest, farm, irrigation, cultivate, water supply, domesticate	Asking questions politely
2	Plant products	Flyer	fruit, vegetable, harvest, tuber, melon, grain, industrial crop, legume, cereal, farmer's market	Asking about prices
3	Animal products	Magazine Article	meat, milk, protein, wool, leather, by-product, fats, bone, hooves, render, tallow	Getting someone's attention
4	Soil	Column	soil, soil structure, aeration, soil texture, sand, silt, clay, loam, humus, parent material, dense	Giving advice
5	Water	Newspaper Article	water cycle, drought, irrigate, ditch, rainfall, arid, groundwater, rain-fed, drought-resistant	Making suggestions
6	Seeds	Seed Catalog	seed, bulk, dormancy, hard coat, germinate, seedling, sow, seed vigor, hybrid, days to maturity, sowing method	Asking for repetition
7	Plant growth	Magazine Article	Quinoa, photosynthesis, roots, growth chart, bud, flower, leaf, branch, seedhead, stalk	Talking about future events
8	Harvest	Harvest Report	reap, mature, yield, threshing, chaff, ton, harvest, bale, bushel, package type	Giving compliments
9	Storage	Email	storage, cool, mold, leveling, aeration, moisture, dry, tower silo, bunker silo, silage bag	Describing a place
10	Feed and nutrients	Job Posting	ration, nutrient, feed, carbohydrate, fat, protein, mineral, vitamin, animal nutritionist	Introductions
11	Housing animals	Blog Post	barn, comfort zone, critical temperature, heat stress, cold stress, space requirements, waste management, slotted floor, pen, coop	Agreeing with an opinion
12	Breeding	Advertisement	breeding, heritability, breeding value, trait selection, feed efficiency, rate of gain, expected progeny difference, sire summary, pedigree	Requesting more information
13	Slaughter and processing	Website	slaughter, process, butcher, head, inspect, kill fee, offal, hide, cut, humane	Clarifying information
14	Cultivation and planting equipment	Classified Ads	rototiller, cultivator, cultipacker, chisel plow, harrow, tractor, stone picker, broadcast seeder, seed drill, planter, transplanter	Asking for someone on the telephone
15	Harvest equipment	Website	chaser bin, combine harvester, conveyor belt, forage harvester, gleaner, gravity wagon, hay conditioner, grain auger, baler, bale wrapper	Stating a goal



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## Get ready!

1 Before you read the passage, talk about these questions.

- 1 When did farming first begin in your country?
- 2 What did farmers first grow in your country?

## Chapter 1 The Development of Agriculture

**Agriculture** began in the area known as the Fertile Crescent. The area is a hot, dry desert. But it has two of the requirements for **farming**: good soil and a **water supply**.

Many early farmers used the Nile River as a water supply. The Nile River floods at the same time every year. Farmers **planted crops** before the floods. This helped their plants to survive in the desert. Later, farmers created **irrigation ditches**. They moved water from the Nile River to their fields. They could **cultivate** crops any time of the year and **harvest** extra food.

**Producing** extra food was important. Later, farmers fed animals with it. These **domesticated** animals became another important part of agriculture.



## Reading

2 Read the textbook passage. Then, mark the following statements as true (T) or false (F).

- 1  Crops cannot grow in deserts.
- 2  The Nile River floods every year.
- 3  Farmers raised animals before plants.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |  |  |
|--|--|
| 1 <input type="checkbox"/> agriculture | 4 <input type="checkbox"/> produce     |
| 2 <input type="checkbox"/> crop        | 5 <input type="checkbox"/> domesticate |
| 3 <input type="checkbox"/> cultivate   | 6 <input type="checkbox"/> plant       |

- A a large group of cultivated plants  
 B to put seeds in soil  
 C growing plants and raising animals  
 D to make something  
 E to raise a crop from seeding to harvest  
 F to tame an animal

4 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **water supply / irrigation**  
 A The river is the farmer's \_\_\_\_\_.  
 B \_\_\_\_\_ helps farmers grow crops in areas with little rainfall.
- 2 **harvesting / farming**  
 A \_\_\_\_\_ includes raising animals and crops.  
 B Farmers wait until crops are mature to start \_\_\_\_\_.

5 🎧 Listen and read the text book passage again. Then, say three things you have learnt from the text.





## Listening

6 Listen to a conversation between a student and teacher in a history class. Choose the correct answers.

1 What is the conversation mainly about?

- A a way to predict floods
- B an early irrigation method
- C the number of early farmers
- D the most common early crops

2 How did farmers control water?

- A They put gates in ditches.
- B They filled ditches with dirt.
- C They carried water in buckets.
- D They planted far from the river.

7 Listen again and complete the conversation.

Student: 1 \_\_\_\_\_, Mrs. Anderson. I have a question about the first farmers.

Teacher: Great. What is it?

Student: Well, they were in a desert. How did they irrigate their 2 \_\_\_\_\_?

Teacher: Oh, with 3 \_\_\_\_\_. They connected their fields and the Nile River.

Student: Okay. So, 4 \_\_\_\_\_ moved through the ditches to the fields.

Teacher: Exactly.

Student: Then, I have another question. How did they 5 \_\_\_\_\_ the water?

Teacher: The ditches had 6 \_\_\_\_\_. They opened and water flowed through.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

*Excuse me.*

*How did early farmers ...*

*They connected ...*

**Student A:** You are a student learning about early agriculture. Ask Student B about:

- water supply
- watering fields
- controlling water

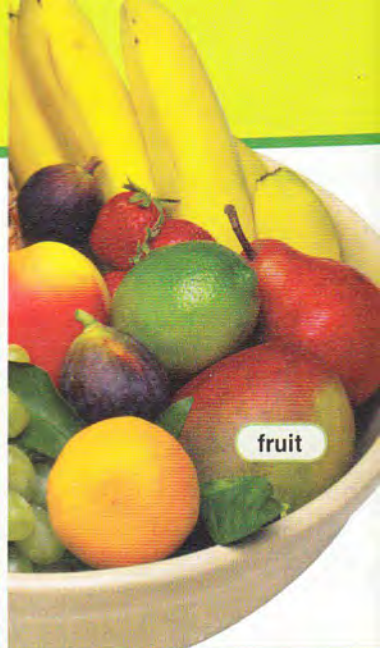
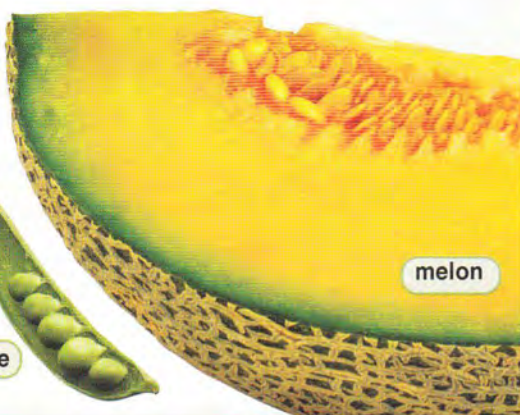
**Student B:** You are a History teacher. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to fill out the student's notes.

Name:	_____	Date:	_____
Class:	_____		
Subject:	_____		
Farmers got water from _____			
_____			
Water came to the fields in _____			
_____			
They controlled water by _____			
_____			





## Support your local farmers!

Come to the **farmer's market** this Saturday, 8AM-3PM on Main Street.

This year's harvest is the best yet!

**JUNE 10**

### FRESH FOOD

Buy fresh **fruit** and **vegetables** for a good price!

**Fruit:** Delicious **melons**, strawberries, and blueberries.

### Vegetables:

Fresh broccoli, peas, and lettuce.

We sell **tubers** and **legumes** too!

\*This week we have Thompson's Granola. Thompson **cereal** crops are grown on a nearby farm.

### CLOTHING

We offer some **industrial** crop products, such as **hemp** shoes, shirts, and hats.

**WE HOPE TO SEE YOU ON SATURDAY!**

### Get ready!

- 1 Before you read the passage, talk about these questions.

- 1 What are your favorite fruits and vegetables?
- 2 What non-food products come from plants?

### Reading

- 2 Read the advertisement. Then, fill in the blanks with the correct items.

- 1 Available fruits:

---



---

- 2 Available vegetables:

---



---

- 3 Cereal products:

---



---

- 4 Industrial crop products:

---



---

### Vocabulary

- 3 Match the words (1-6) with the definitions (A-F).

- |               |                       |
|---------------|-----------------------|
| 1 ___ harvest | 4 ___ tuber           |
| 2 ___ legume  | 5 ___ cereal          |
| 3 ___ melon   | 6 ___ farmer's market |

- A a crop that grows underground  
 B a crop that produces grain  
 C a crop that has pods  
 D crops that have been gathered  
 E a type of large, sweet fruit  
 F a group of farmers selling crops







## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What types of meat come from animals?
- 2 What other products come from animals?



## More than a Meal

We rely on animals for a number of products. Some are more obvious than others. Animals' **milk** and **meat** provide us with **protein**. We make clothing and furniture with wool and leather. In addition, there is a long list of animal **by-products**. We use them every day. But we don't always know it.

We **render fat**, or **tallow**, into tires, soaps, and candles. Marshmallows, buttons, and tape include **bones** and **hooves**. Wool is often used in carpet. Even baseballs use animal products.

Animal by-products are found in unexpected places. Thanks to rendering, very little goes to waste. Meat is just one of many products that we take from animals.

## Reading

2 Read the magazine article. Then, choose the correct answers.

- 1 What is the article mainly about?
  - A Animals that only produce meat
  - B The most popular types of meat
  - C Products made from animals
  - D Waste products of rendering
- 2 Which of the following is NOT a by-product?
 

A fat	C hooves
B bone	D protein
- 3 What is true of rendering?
  - A It limits waste.
  - B It is a by-product.
  - C It provides protein.
  - D It is in marshmallows.

## Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 **wool / milk**

- A \_\_\_\_\_ is an important food source.  
 B Many clothes are made of \_\_\_\_\_.

2 **protein / leather**

- A \_\_\_\_\_ is often used to cover furniture.  
 B Plant products and meat contain \_\_\_\_\_.

3 **meat / by-products**

- A Humans have always used animals for \_\_\_\_\_.  
 B \_\_\_\_\_ are used in many common products.



4 Write a word that is similar in meaning to the underlined part.

- Too much oily substance from plants and animals is unhealthy.  
\_ \_ \_ \_
- Hard materials that give a body structure are a by-product.  
\_ o \_ \_ s
- The hard feet of animals are used to make tape.  
h \_ \_ v \_ \_
- Soap is made by melting animal fat.  
r \_ \_ \_ \_ \_ i n g
- Fat that is used to make candles is also used in soap.  
\_ a \_ \_ o w

5 Listen and read the magazine article again. What happens to animal fat before it is used to produce soaps?

## Listening

6 Listen to a conversation between a manager and a developer at a meeting. Mark the following statements as true (T) or false (F).

- \_\_\_ The new product has no extra chemicals.
- \_\_\_ The all-natural soap will be expensive.
- \_\_\_ Tallow is rarely used in soap.

7 Listen again and complete the conversation.

**Manager:** 1 \_\_\_\_\_ . We have a new product to sell. Miss Smith will tell us about it.

**Developer:** Okay. Customers want natural products, right? So we made an all-natural soap.

**Manager:** What 2 \_\_\_\_\_ by "all-natural"?

**Developer:** There are no extra 3 \_\_\_\_\_ . It's just the basic ingredients.

**Manager:** Sounds interesting. Will it be 4 \_\_\_\_\_ ?

**Developer:** No. After all, the main ingredient is tallow.

**Manager:** 5 \_\_\_\_\_ . What's tallow?

**Developer:** Oh, tallow is basically animal fat. It's used in 6 \_\_\_\_\_ .

**Manager:** And it's cheap?

**Developer:** Very. It's a by-product that few people use.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*We have a new product.*  
*What do you mean by ...*  
*The main ingredient is ...*

**Student A:** You are a salesman. Ask Student B about:

- a new product
- ingredients
- price

**Student B:** You created a new product that uses animal by-products. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 and the magazine article to fill out the product description.

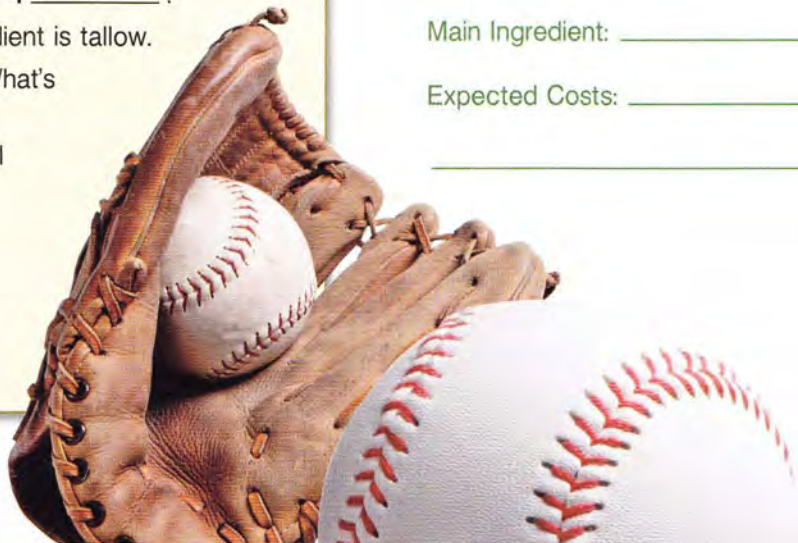
### NEW PRODUCT NOTES

Product: \_\_\_\_\_

Description/Special Qualities: \_\_\_\_\_

Main Ingredient: \_\_\_\_\_

Expected Costs: \_\_\_\_\_





## CultiAdvice

### Dear Green Thumb:

My tomatoes are dying. They get plenty of sun and water. What am I doing wrong? – Tom G.

### Dear Tom:

Check the **soil**. Tomato roots need the right amount of water and air. They don't do well in **sand** or **clay**. Both have the wrong **soil structure**. Sand particles are too loose to hold enough water. **Dense** clay prevents **aeration**. You need a **soil texture** in between those extremes. **Loam** with high **silt** is usually good.

The other issue is nutrients. A soil's **parent material** determines what nutrients are in it. You can improve the nutrients by adding **humus**.



### Get ready!

#### 1 Before you read the passage, talk about these questions.

- 1 What kind of soil is there in your country?
- 2 Why is good soil important?

### Reading

#### 2 Read the newspaper advice column. Then, mark the following statements as true (T) or false (F).

- 1  Tomatoes grow well in clay.
- 2  Aeration does not occur in clay.
- 3  Humus adds nutrients to soil.

### Vocabulary

#### 3 Fill in the blanks with the correct words and phrases from the word bank.

#### Word BANK

aeration clay loam humus soil structures

- 1 Some \_\_\_\_\_ hold more water than others.
- 2 Crops don't grow well in pure \_\_\_\_\_ soil.
- 3 Use \_\_\_\_\_ to add nutrients to soil.
- 4 \_\_\_\_\_ provides roots with air.
- 5 \_\_\_\_\_ is a mix of three soil types.

#### 4 Match the words (1-6) with the definitions (A-F).

- 1  soil
- 2  sand
- 3  silt
- 4  soil texture
- 5  parent material
- 6  dense

- A a material made of small pieces of rock and mineral
- B a material that is deposited by water
- C rock and minerals that eventually form soil
- D a layer of material that plants grow in
- E the size of particles in a soil
- F having a lot of material in a small space



5 Listen and read the newspaper advice column again. What do you need to take into consideration when planting tomatoes?

## Listening

6 Listen to a conversation between a customer and clerk in a plant supply store. Choose the correct answers.

- 1 What is the customer buying at the store?  
A soil                      C houseplants  
B pots                      D vegetables
- 2 Why does the clerk recommend Wonder Grow?  
A It contains no clay.  
B It has dense soil structure.  
C It supports vegetable growth.  
D It has good aeration and holds water.

7 Listen again and complete the conversation.

Clerk: Hi. Can I help you with anything?  
Customer: Yes. I need some 1 \_\_\_\_\_ .  
Clerk: Is this for indoor or outdoor plants?  
Customer: It's for indoor plants.  
Clerk: What kinds of plants is it for? Houseplants? flowering plants? vegetables?  
Customer: I have some spider plants. They need to be put in 2 \_\_\_\_\_ .  
Clerk: 3 \_\_\_\_\_ , you should use Wonder Grow. It has 4 \_\_\_\_\_ and 5 \_\_\_\_\_ well, too.  
Customer: Okay, 6 \_\_\_\_\_ . Thanks for your help.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I need some ...*

*What kind of plants is it for?*

*You should use ...*

**Student A:** You work in a plant supply store. Talk to Student B about:

- type of plants
- soil types
- soil description

**Student B:** You need soil for your plants. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 and the newspaper advice column to fill out the product description.

**Product name:** \_\_\_\_\_

\_\_\_\_\_ can be used for \_\_\_\_\_  
or \_\_\_\_\_ .

It supports \_\_\_\_\_ and \_\_\_\_\_  
growth.

Best of all, it has \_\_\_\_\_ and \_\_\_\_\_  
better than any product.





## Get ready!

1 Before you read the passage, talk about these questions.

- 1 Where do farmers get water?
- 2 How do water shortages hurt farmers?

## Reading

2 Read the article from the San Fernando Sun newspaper. Then, choose the correct answers.

- 1 What is the article mostly about?
  - A a crop shortage
  - B a lack of rainfall
  - C new irrigation methods
  - D new types of crops
- 2 According to the article, what will cause a water shortage in the future?
  - A raising rain-fed crops
  - B using extra groundwater
  - C farming in arid locations
  - D planting crops in the mountains
- 3 What is true of the peaches and nectarines?
  - A They will not be damaged by the drought.
  - B They will be more expensive this year.
  - C They will need more water than most fruits.
  - D They will be grown by out of town farmers.

## Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **ditch / groundwater**
  - A Irrigate the crops by digging a \_\_\_\_\_.
  - B Areas with a lot of \_\_\_\_\_ are ideal for farming.
- 2 **shortage / rainfall**
  - A With so much \_\_\_\_\_, Dawn didn't have to water her plants.
  - B Many crops died due to the water \_\_\_\_\_.
- 3 **rain-fed / drought-resistant**
  - A Linda prefers \_\_\_\_\_ crops since she lives in an arid region.
  - B Andrew doesn't irrigate; his crops are \_\_\_\_\_.



**4 Match the words (1-4) with the definitions (A-D).**

- 1 \_\_\_ water cycle      3 \_\_\_ arid  
2 \_\_\_ drought        4 \_\_\_ irrigate

- A to guide water to plants  
B the pattern of water moving and changing form  
C receiving little rainfall  
D a period of unusual dryness

**5 Listen and read the article from the San Fernando Sun newspaper again. Why has the fact that there has been less rainfall in the mountains affected the region?**

### Listening

**6 Listen to a conversation between two farmers. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ The man's vegetable crop died.  
2 \_\_\_ The woman might expand her irrigation system.  
3 \_\_\_ The woman does not have drought-resistant crops.

**7 Listen again and complete the conversation.**

- Farmer 1: I'm worried. My vegetables won't  
1 \_\_\_\_\_ if this drought continues.
- Farmer 2: I feel the same way. My lettuce and cucumbers aren't doing well.
- Farmer 1: What are you going to 2 \_\_\_\_\_ it?
- Farmer 2: I might 3 \_\_\_\_\_ my irrigation system.
- Farmer 1: That 4 \_\_\_\_\_ very expensive.
- Farmer 2: I agree. But I don't know what else to do.
- Farmer 1: You could always plant 5 \_\_\_\_\_ - \_\_\_\_\_ vegetables next year.
- Farmer 2: That's a good idea. It will cost less. But it  
6 \_\_\_\_\_ this year.

### Speaking

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*My ... aren't doing well.*

*You could always ...*

*That's a good idea.*

**Student A:** You are a farmer during a drought. Talk to Student B about:

- your crops
- irrigation
- other solutions

**Student B:** You are a farmer during a drought. Discuss solutions with Student A.

### Writing

**9 Use the conversation from Task 8 to fill out the farm report.**

**FARM REPORT**

Date: \_\_\_\_\_

Crops Planted: \_\_\_\_\_

\_\_\_\_\_

Crop Condition: \_\_\_\_\_

\_\_\_\_\_

Water Problems: \_\_\_\_\_

\_\_\_\_\_

Possible Solutions: \_\_\_\_\_

\_\_\_\_\_



Cold-weather **hybrid** broccoli. Bred for superior **seed vigor**. **Seedlings** survive in temperatures down to 37° F.

Germination: Soak seeds in water overnight to remove **hard coats** and end **dormancy**. Place in 70° F soil to **germinate**.

Location: **Sow** in a place that gets full sun.

**Sowing method:** Use a pen or similar shaped object to prepare holes 0.5 cm deep, 2 cm apart. Drop one **seed** per hole. Cover with soil. Water.

Days to sprout: 7-14

**Days to maturity:** 58

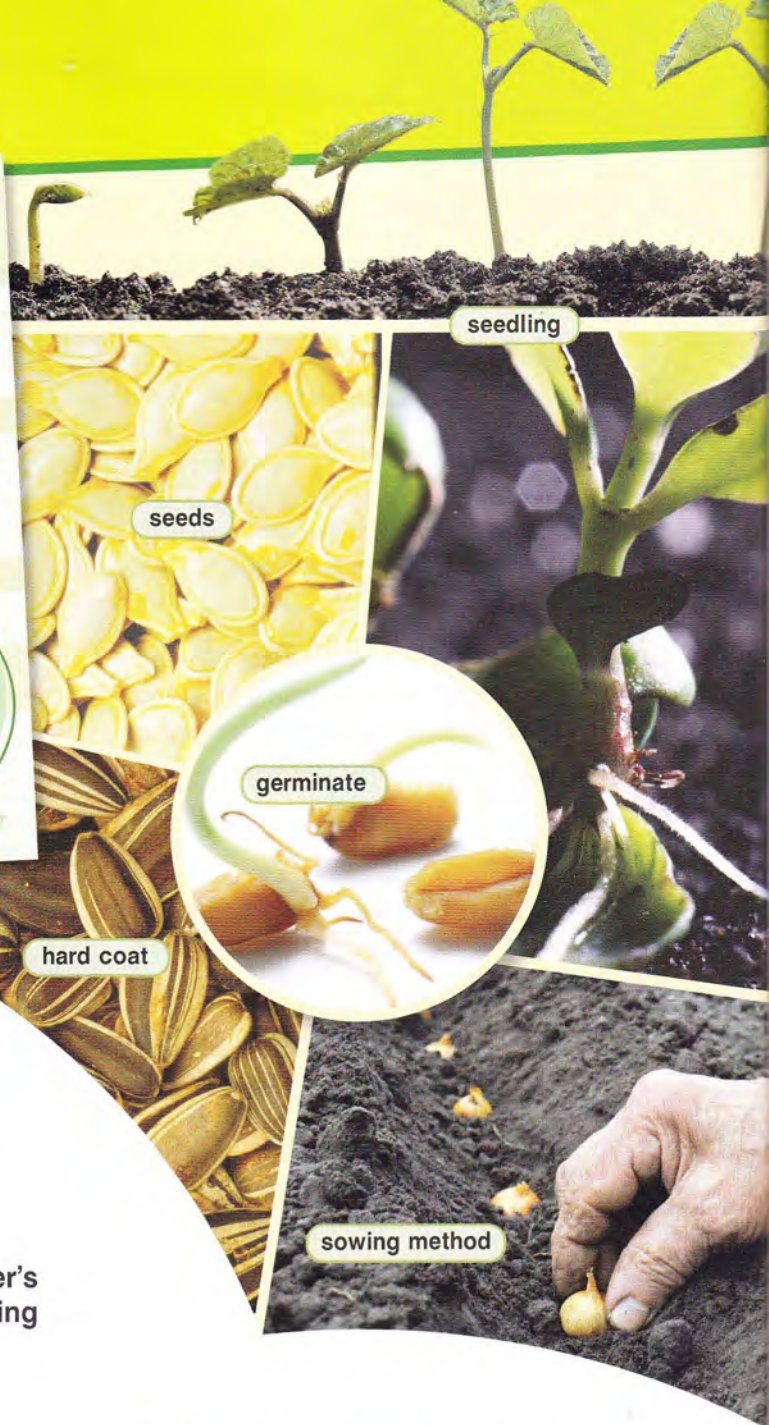
Harvest: Cut buds before they flower.

Price : \$ 0.5 / 100 g. packet\*

\*Bulk orders of 100 or more receive a discount of 10%

The New Gardener

pg. 17



seedling

seeds

germinate

hard coat

sowing method

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How do farmers plant seeds?
- 2 What do seeds need to grow?

## Reading

2 Read the page from The New Gardener's Seed catalog. Then, mark the following statements as true (T) or false (F).

- 1  The seedlings can survive below 37° F.
- 2  The broccoli seeds have hard coats.
- 3  The seeds will sprout within two weeks.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                      |                                       |
|--------------------------------------|---------------------------------------|
| 1 <input type="checkbox"/> hard coat | 4 <input type="checkbox"/> seed vigor |
| 2 <input type="checkbox"/> germinate | 5 <input type="checkbox"/> hybrid     |
| 3 <input type="checkbox"/> seedling  | 6 <input type="checkbox"/> sow        |

- A the firm outer layer of a seed  
 B to sprout from a seed  
 C to plant seeds  
 D made by parents of different breeds  
 E a young plant  
 F the strength and survivability of a seed

4 Write a word that is similar in meaning to the underlined part.

- 1 Farmers plant small objects from which plants grow in the spring.  
s \_ \_ d \_
- 2 Each plant has a different number of days until it can be harvested.  
d \_ \_ \_ t \_ m a \_ \_ \_ \_ y
- 3 Some plants require special ways in which seeds are planted.  
\_ o w \_ \_ \_ m e \_ \_ \_ \_ \_
- 4 To plant a large crop, you need a large quantity order of seeds.  
b \_ \_ k
- 5 Some plants produce seeds that pass the winter in an inactive state.  
\_ o r \_ \_ \_ \_ y



- 5 Listen and read the page from The New Gardener's Seed catalog again. How many weeks will it take for the broccoli to be edible?

## Listening

- 6 Listen to a conversation between a customer and a farmer. Mark the following statements as true (T) or false (F).

- 1  The customer wants watermelon seeds.
- 2  The farmer does not have the seed varieties that the customer wants.
- 3  The customer will receive 10% off.

- 7 Listen again and complete the conversation.

**Farmer:** Hi there. Welcome to Braxton Farms. How can I help you?

**Customer:** Hi, I'd like to buy some seeds.

**Farmer:** Great. What varieties are you interested in?

**Customer:** I want some 1 \_\_\_\_\_, the Super King. And some cantaloupe, the Royal Gold.

**Farmer:** I'm sorry. I 2 \_\_\_\_\_ that.

**Customer:** Super King watermelon and Royal Gold cantaloupe.

**Farmer:** 3 \_\_\_\_\_. Also, we have a special today on 4 \_\_\_\_\_ orders. You get 10% off.

**Customer:** 5 \_\_\_\_\_. I only need two packets of each.

**Farmer:** Well, they 6 \_\_\_\_\_ packs of 3 for \$3.78.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I'd like to buy some seeds.*

*What varieties are you interested in?*

*I only need ...*

**Student A:** You are a farmer selling seeds. Talk to Student B about:

- seed varieties
- discounts
- total price

**Student B:** You are buying seeds. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 to fill out the receipt.

### BRAXTON FARMS Sales Receipt

Seed Variety: \_\_\_\_\_

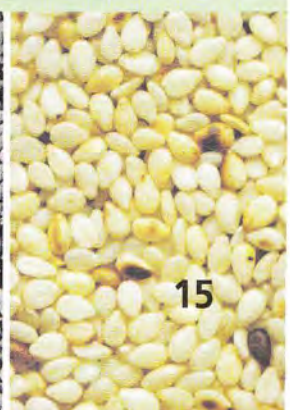
Number of packets: \_\_\_\_\_

Seed Variety: \_\_\_\_\_

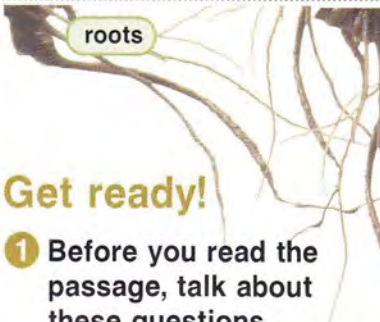
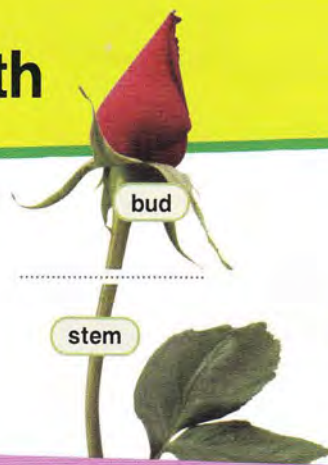
Number of packets: \_\_\_\_\_

Discount? Y / N

Total Price: \_\_\_\_\_







### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How do plants change as they grow?
- 2 What function does each part of a plant serve?



## QUINOA on the Rise

Few plants have as much protein as quinoa, and it can grow in many environments. For that reason, it's become popular with gardeners and commercial farmers alike. Check out the following tips to grow quinoa at home.

Quinoa requires full sun to conduct **photosynthesis**. Sow seeds where the plant will get plenty of light. Provide at least 10 inches between rows to give the **roots** plenty of space.

If you maintain **growth charts**, you'll notice that quinoa grows slowly at first. But when the **stem** reaches about 12 inches, the **buds** will **flower**. The plant is ready for harvest when the **leaves** drop. Only the **seedheads** will remain. These can be stripped from the **branches** with little effort. Remove and dry the seeds for your first quinoa harvest.

*Gardener's Monthly*

19

### Reading

2 Read the magazine article. Then, mark the following statements as true (T) or false (F).

- 1  No plant has more protein than quinoa.
- 2  Quinoa sprouts quickly and then slows.
- 3  Farmers who grow quinoa harvest its seeds.

### Vocabulary

3 Match the words (1-4) with the definitions (A-D).

- |   |                                   |
|---|-----------------------------------|
| 1 <input type="checkbox"/> photosynthesis | 3 <input type="checkbox"/> stalk  |
| 2 <input type="checkbox"/> branch         | 4 <input type="checkbox"/> quinoa |

- A a narrow part that supports leaves  
 B a chemical process that produces energy  
 C a limb of a plant  
 D a strong plant that is grown for its seeds

4 Fill in the blanks with the correct words and phrases from the word bank.

### Word BANK

roots    growth chart    seedhead  
 leaves    buds    flowering

- 1 Those \_\_\_\_\_ will grow into flowers.
- 2 Plants absorb nutrients from the soil with their \_\_\_\_\_.
- 3 Photosynthesis occurs in the \_\_\_\_\_ of a plant.
- 4 Tom keeps a detailed \_\_\_\_\_ of his crops to test how effective his fertilizers are.
- 5 \_\_\_\_\_ plants usually produce colorful blooms in the spring.
- 6 The \_\_\_\_\_ of a quinoa plant contains the protein-rich harvest.



- 5 🎧 Listen and read the magazine article again. Why do gardeners like quinoa?

## Listening

- 6 🎧 Listen to a conversation between two farmers discussing plant growth. Mark the following statements as true (T) or false (F).

- 1 \_\_\_ The man planted quinoa for the first time.
- 2 \_\_\_ The woman's crops did not grow.
- 3 \_\_\_ The woman planted quinoa on thousands of acres.

- 7 🎧 Listen again and complete the conversation.

Farmer 1: Susan, you planted quinoa for the first time this year, 1 \_\_\_\_\_ ?

Farmer 2: I did. I was worried 2 \_\_\_\_\_ . But it seems okay now.

Farmer 1: Worried? Why?

Farmer 2: It was growing so slowly. But it just 3 \_\_\_\_\_ for the buds to flower.

Farmer 1: Oh, so they're 4 \_\_\_\_\_ ?

Farmer 2: Yeah, they are. We expect to harvest them next week.

Farmer 1: That's great. How much do you expect to harvest?

Farmer 2: Well, we only planted a 5 \_\_\_\_\_ . So probably two thousand pounds 6 \_\_\_\_\_ .

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*You planted quinoa?*

*Worried? Why?*

*How much do you expect to harvest?*

**Student A:** You are a farmer. Ask Student B about planting quinoa for the first time. Talk about:

- growth rate
- concerns
- expected harvest

**Student B:** You are a farmer. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 to fill out the farmers' notes on the first quinoa harvest.

### Quinoa Harvest Summary

Acres Planted: \_\_\_\_\_

Summary of Crop Growth: \_\_\_\_\_

Expected Harvest: \_\_\_\_\_

Actual Harvest: \_\_\_\_\_





## REYNOLDS HARVESTING

## HARVEST SUMMARY REPORT

Farm: 0024

Crops: Hay and Wheat

Harvest Date	Field # / Crop	Yield	Package Type	Package Weight	Rained On
06/29	1 / Hay	0.5 ton / acre	Round Bale	0.6 tons	No
08/16	2 / Wheat	30 bushels / acre	Bushel	600 bushels	Yes
10/02	3 / Wheat	80 bushels / acre	Bushel	1600 bushels	No

**Notes:** Field #1 had the most abundant yield. Field #2 was more difficult. It **matured** later than expected. The farmers **reaped** several **bushels** too early. We also experienced an equipment problem during **threshing**. Some of the hay was not properly separated from the **chaff**. Field #3 was more successful. Inspectors discarded nearly a ton of unacceptable material from the **stacks**. Most came out of field #2.

## Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 reap / mature

A \_\_\_\_\_ the crops in six months.

B Some plants take longer to \_\_\_\_\_.

2 chaff / harvest

A The annual \_\_\_\_\_ is next month.

B This machine removes the unusable \_\_\_\_\_.

2 tons / bales

A There were many more \_\_\_\_\_ of hay this year.

B How many \_\_\_\_\_ of wheat were harvested?

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 When do farmers harvest crops in your country?
- 2 How do farmers gather crops during harvest?

## Reading

2 Read the harvest summary report. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ The crops all have the same package type.
- 2 \_\_\_ None of the crops were rained on.
- 3 \_\_\_ Field #2 produced the smallest amount of wheat.

4 Write a word that is similar in meaning to the underlined part.

- 1 This year's quantity of crops produced was twice last year's. y \_ \_ \_ d
- 2 Removing unusable parts from wheat makes it edible. \_ h \_ \_ s \_ \_ n \_
- 3 Instead of gathering the crops in bales, we left them in organized piles. \_ t a \_ \_ \_
- 4 When you go to the market, get 2 units of measurement equal to 9.3 Gallons of grain. b \_ s \_ \_ \_ \_
- 5 When you place an order, tell them what form of packaging to use. p \_ \_ \_ \_ \_ \_ t \_ \_ \_



5 Listen and read the harvest summary report again. What problems did farmers experience with this year's harvest?

**Listening**

6 Listen to a conversation between two farmers discussing a harvest. Choose the correct answers.

- How does the man feel about the harvest?  
 A worried                      C confused  
 B pleased                        D disappointed
- What can you infer about the farmers' planting method?  
 A It was unsuccessful.  
 B It created a smaller harvest.  
 C It had not been used before.  
 D It involved several types of crops.

7 Listen again and complete the conversation.

Farmer 1: Cathy, what's the 1 \_\_\_\_\_ on the latest corn harvest?

Farmer 2: Well, we have fifteen tons for immediate sale.

Farmer 1: Fifteen tons? 1 \_\_\_\_\_ tons did we sell from the last field?

Farmer 2: Um, let's see. We sold eleven tons from the last field.

Farmer 1: That's 3 \_\_\_\_\_! Your new 4 \_\_\_\_\_ is working nicely.

Farmer 2: Yes, it is. We also expect to approve another five tons by Friday.

Farmer 1: 5 \_\_\_\_\_, Cathy. This is our 6 \_\_\_\_\_ harvest ever.



**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

- We have ... for sale.*
- We will approve ... by ...*
- This is our ... harvest*

**Student A:** You are a farmer. Talk to Student B about:

- a crop report
- tons sold
- your opinion of harvest

**Student B:** You are a farmer. Answer Student A's questions.

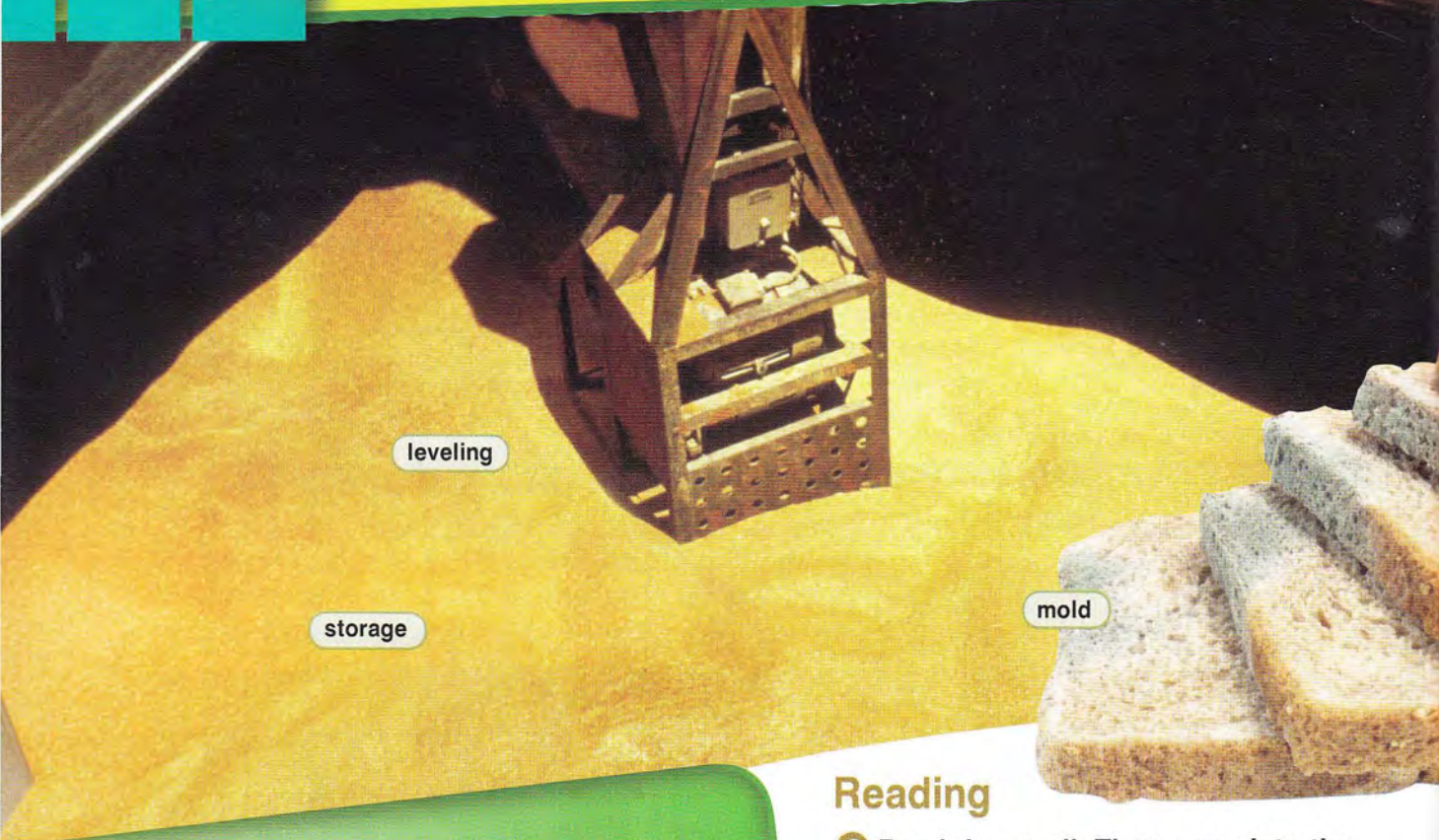
**Writing**

9 Use the conversation from Task 8 to fill out the crop report.

Date	Crop	Package Type	Package Weight







To: t.garcia@garciafarms.com  
 From: c.thompson@garciafarms.com  
 Subject: Storage Problem

Mr. Garcia,

We found a problem in **bunker silo** number 13. **Mold** is growing near the south opening. I suspect two causes. First, there was improper **leveling**. Too much **moisture** gathered at one end. Secondly, the silo has too much **ventilation**. It can't **dry** and **cool** the silage.

As a result, most of the silage is destroyed. The rest is in **silage bags** for now. Number 13 is closed until we remove the mold. Should we use one of the **tower silos** for **storage** in the meantime? We should also discuss how to fix number 13. I don't want this to happen again.

Thank you,  
 Carla Thompson, Storage Manager

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How do farmers store crops in your country?
- 2 How can stored crops be damaged?

### Reading

2 Read the email. Then, complete the summary of the email.

Workers discovered mold in 1 \_\_\_\_\_.  
 13. There were two causes: improper 2 \_\_\_\_\_  
 and too much 3 \_\_\_\_\_. Most of the silage was  
 destroyed. The rest is in 4 \_\_\_\_\_ bags. The  
 workers might store silage in the 5 \_\_\_\_\_ silos.

### Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 cool / dry

A \_\_\_\_\_ the grain or the heat will ruin it.

B After the harvest, \_\_\_\_\_ the wet crops.

2 storage / mold

A Nancy is worried about getting \_\_\_\_\_ in her silo.

B Jim sold some of the grain and put the rest in \_\_\_\_\_.

3 silage bag / ventilation

A There's a problem with the silo; use a \_\_\_\_\_.

B Don's storage facilities have excellent \_\_\_\_\_.



**4 Match the words (1-4) with the definitions (A-D).**

- 1 — leveling                      3 — tower silo  
 2 — moisture                    4 — bunker silo

- A flattening the top of a pile  
 B a long trench used to store grain  
 C wetness  
 D a tall storage facility

**5 Listen and read the email again. Why is Carla Thompson contacting Mr. Garcia?**

**Listening**

**6 Listen to a conversation between a farm owner and a storage manager. Mark the following statements as true (T) or false (F).**

- 1 — A machine improperly leveled the grain.  
 2 — The new assistant will receive more training.  
 3 — Workers will use silage bags until the ventilation works.

**7 Listen again and complete the conversation.**

**Manager:** Mr. Garcia, did you get my email about the bunker silo?

**Owner:** I did. How bad is it?

**Manager:** It's pretty bad. There's mold  
 1 \_\_\_\_\_

**Owner:** How did this happen?

**Manager:** It was our 2 \_\_\_\_\_  
 \_\_\_\_\_. He wasn't  
 trained on 3 \_\_\_\_\_.

**Owner:** Well, 4 \_\_\_\_\_  
 \_\_\_\_\_ he gets trained.

**Manager:** Of course. We're also  
 checking the 5 \_\_\_\_\_  
 system. There's too much air  
 moving in there.

**Owner:** Use the 6 \_\_\_\_\_  
 \_\_\_\_\_ until you fix it. And  
 keep me updated.



**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

- How bad is it?*  
*How did this happen?*  
*Use the ... until ...*

**Student A:** You are a farm owner. Talk to Student B about:

- mold in a silo
- causes
- storage

**Student B:** You are a storage manager. Answer Student A's questions.

**Writing**

**9 Use the conversation from Task 8 and the email to fill out the storage manager's message to farm workers.**

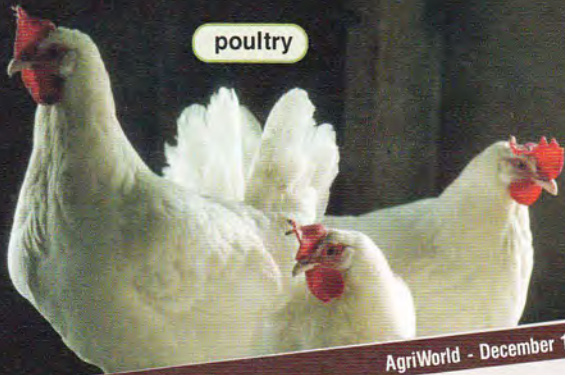
**ATTENTION**

Bunker silo 13 \_\_\_\_\_  
 This was caused by \_\_\_\_\_  
 and \_\_\_\_\_  
 Use \_\_\_\_\_ until it is fixed.  
 There is training on \_\_\_\_\_  
 for all new employees this week.





poultry



AgriWorld - December 17

## POSTING #09500 Animal Nutritionist

Date posted: Jan. 25  
Employer: Hillford Poultry Farm  
Location: Lancaster, PA

Job Description: Prepare **feed** formula for fifteen varieties of chicken. Research and select low-cost ingredients with high **nutrient** content. Balance **carbohydrate**, fat, protein, **vitamin**, and **mineral** content in daily **rations**. Adjust feed formula as needed.

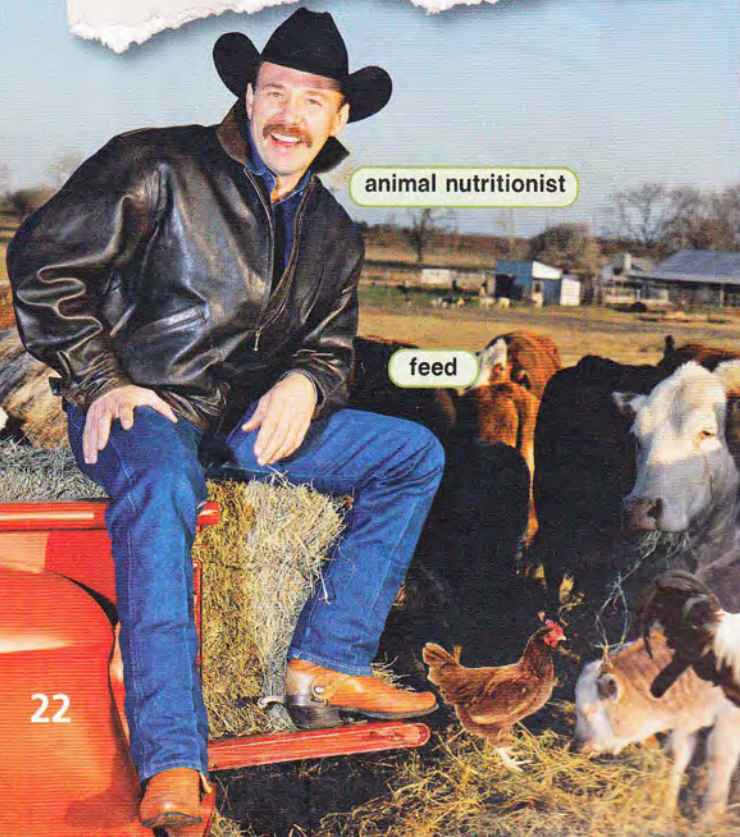
Job Qualifications: Masters Degree or higher in animal **nutrition**. Minimum of two years' experience, preferably on a **poultry** farm.

Salary: Based on experience, generous benefit package available.

Contact Information: Brian Walker (610) 555-5905  
bwalker@hillford.com

animal nutritionist

feed



### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What types of food do farm animals eat?
- 2 How does feed affect animals' growth?

### Reading

2 Read the job posting. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ Hillford Farms has fifteen varieties of chicken.
- 2 \_\_\_ The Hillford Farms daily ration includes fats.
- 3 \_\_\_ Applicants need a degree in poultry management.

### Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |                |                           |
|----------------|---------------------------|
| 1 ___ nutrient | 4 ___ animal nutritionist |
| 2 ___ feed     | 5 ___ vitamin             |
| 3 ___ poultry  |                           |

- A an organic substance found in food that is essential for good health
- B food given to animals
- C a person who makes healthy food for animals
- D any organic or inorganic substance that provides nourishment
- E domesticated birds such as chickens and turkeys

4 Write a word that is similar in meaning to the underlined part.

- 1 Henry increased the daily amount of food.  
r \_ \_ \_ \_ n
- 2 Inorganic substances like potassium are essential for good health.  
\_ i \_ \_ r a \_ \_
- 3 Besides sleep and shelter, the process of nourishing an organism is the most important thing that every organism needs.  
\_ u \_ r \_ t \_ \_ \_
- 4 Animals need a sufficient amount of substances used to make energy in their diet.  
c a \_ \_ \_ \_ \_ \_ \_ \_ t e \_





- 5 Listen and read the job posting again. What will be the main duties of the animal nutritionist?

## Listening

- 6 Listen to a conversation between an interviewer and a job applicant. Choose the correct answers.

- What does the applicant make at AGM Industries?
  - low-fat chicken feed
  - high-protein pig feed
  - low-carbohydrate pig feed
  - high-carbohydrate chicken feed
- What requirement does the applicant meet?
  - He has one year of experience.
  - He has worked with chickens.
  - He has created special feeds.
  - He has worked for Hillford Farms.

- 7 Listen again and complete the conversation.

**Interviewer:** Good morning. Mr. Jordan, I'm Terry Riley.

**Job applicant:** 1 \_\_\_\_\_ you, Miss Riley.

**Interviewer:** Nice to meet you too. Please, 2 \_\_\_\_\_ and we'll get started.

**Job applicant:** Thank you. Did you get my resume?

**Interviewer:** Yes, I did. It looks very good. 3 \_\_\_\_\_ your work at AGM Industries.

**Job applicant:** Well, I work at their 4 \_\_\_\_\_ . I create special formulas for high-protein feed.

**Interviewer:** Interesting. Now, applicants must have experience with 5 \_\_\_\_\_. Have you ever worked with 6 \_\_\_\_\_?

**Job applicant:** Yes, in my previous job. It was at Reynolds Farms.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Nice to meet you.*

*Tell me about ...*

*Have you ever worked with ...*

**Student A:** You are interviewing a job applicant. Talk to Student B about:

- resume
- current job
- experience

**Student B:** You are interviewing for a job. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the job posting to fill out the applicant's resume.

Name: \_\_\_\_\_

Position applying for: \_\_\_\_\_

Current Position: \_\_\_\_\_

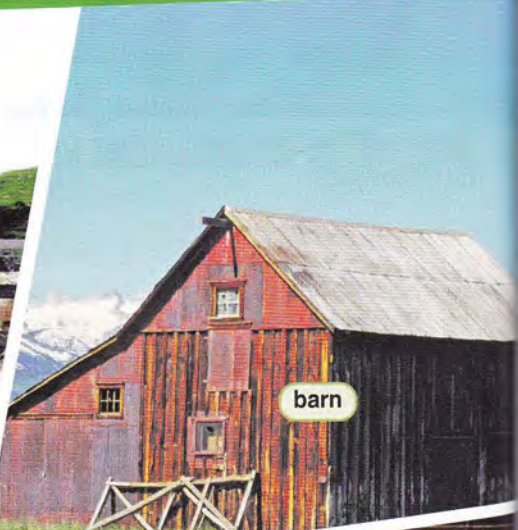
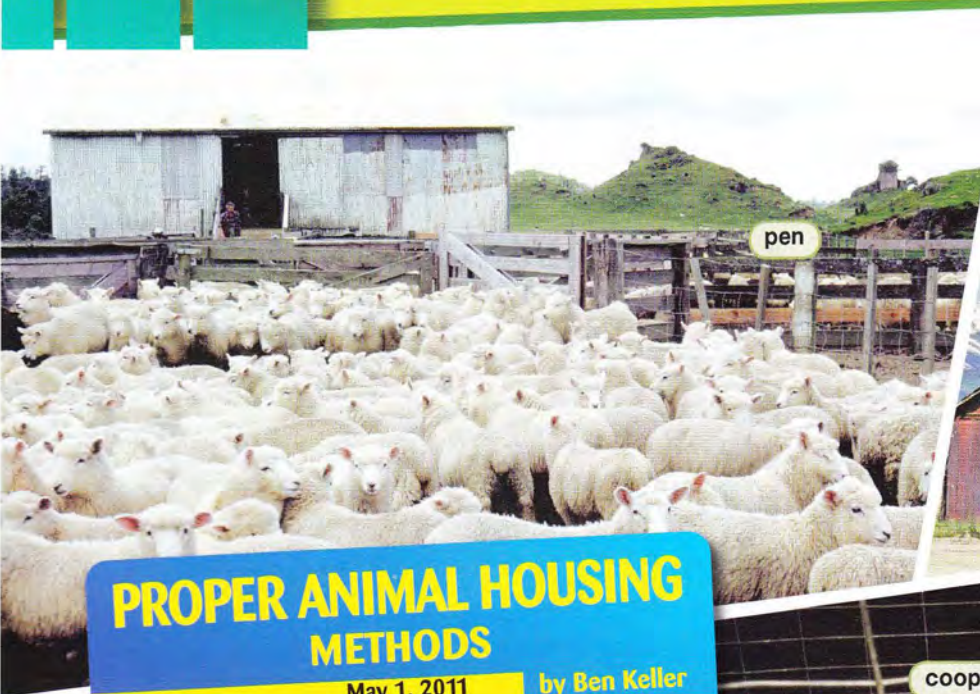
Responsibilities: \_\_\_\_\_  
\_\_\_\_\_

Former Position: \_\_\_\_\_

Responsibilities: \_\_\_\_\_  
\_\_\_\_\_







## PROPER ANIMAL HOUSING METHODS

May 1, 2011

by Ben Keller

Here are some tips for how to properly house animals. I will use my hog barn as an example. The ideas apply to **coops** and **pens** as well. Animals with proper housing are in their **comfort zones**. They are healthier and more productive than animals with poor housing.

First, make sure the enclosure matches the **space requirements** of the animal. You also need to know the animals' critical temperatures. Install automated heating and cooling to prevent **heat stress** and **cold stress**. Don't forget to have a good **waste management** system. **Slotted floors** provide a simple way to keep your animal's living space clean.



### Get ready!

1 Before you read the passage, talk about these questions.

- How are animals housed in your country?
- How do workers maintain animal housing structures?

### Reading

2 Read the page from a farming blog. Then, mark the following statements as true (T) or false (F).

- \_\_\_ The author raises poultry.
- \_\_\_ Housing affects animals' productivity.
- \_\_\_ Slotted floors prevent heat stress.

### Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 **coop / cold stress**

A The chickens live in a separate \_\_\_\_\_.

B Install a heater to prevent \_\_\_\_\_.

2 **heat stress / pen**

A During the summer, \_\_\_\_\_ is a problem.

B Pigs do best if they are kept in their own \_\_\_\_\_.

3 **slotted floor / waste management**

A \_\_\_\_\_ is essential for odor control.

B A \_\_\_\_\_ helps air to circulate.



**4 Match the words (1-4) with the definitions (A-D).**

- 1 \_\_\_ barn
- 2 \_\_\_ comfort zone
- 3 \_\_\_ critical temperature
- 4 \_\_\_ space requirement

- A conditions under which an animal is comfortable
- B a structure used to house animals
- C the amount of space that an animal needs
- D a temperature that must be maintained

**5 Listen and read the page from a farming blog again. Apart from proper housing, what else do animals require to be productive?**

**Listening**

**6 Listen to a conversation between two farmers discussing animal housing. Place a check (✓) next to reasons they need a new barn.**

- 1  They will have more animals.
- 2  The barn gets too cold in winter.
- 3  The barn has poor ventilation.
- 4  They want to add slotted floors.
- 5  The barn doesn't meet space requirements.

**7 Listen again and complete the conversation.**

Farmer 1: I think we need a new barn.  
 Farmer 2: What's wrong with this one?  
 Farmer 1: First, the 1 \_\_\_\_\_ isn't very good.  
 Farmer 2: I agree with you there. It's 2 \_\_\_\_\_  
 \_\_\_\_\_ in here during the  
 3 \_\_\_\_\_.  
 Farmer 1: And don't forget, we're getting  
 4 \_\_\_\_\_ in  
 May.  
 Farmer 2: That's a 5 \_\_\_\_\_. We'll  
 need more space then.  
 Farmer 1: I'll talk with a builder tomorrow.  
 Farmer 2: Let's estimate the 6 \_\_\_\_\_  
 \_\_\_\_\_ first.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

- I think we need a new barn.*
- I agree with you there.*
- We'll need more space.*

**Student A:** You are a farmer. You want a new barn. Talk to Student B about:

- a new barn
- temperature
- animals and space

**Student B:** You work with Student A on a farm. Answer Student A's questions.

**Writing**

**9 Use the conversation from Task 8 to fill out the farmers' letter to a builder.**

Dear Mr. Haynes,

We need \_\_\_\_\_.

Our current barn \_\_\_\_\_.

And we are getting \_\_\_\_\_.

The barn won't meet \_\_\_\_\_.

We need the new barn \_\_\_\_\_.

It should be able to house \_\_\_\_\_.

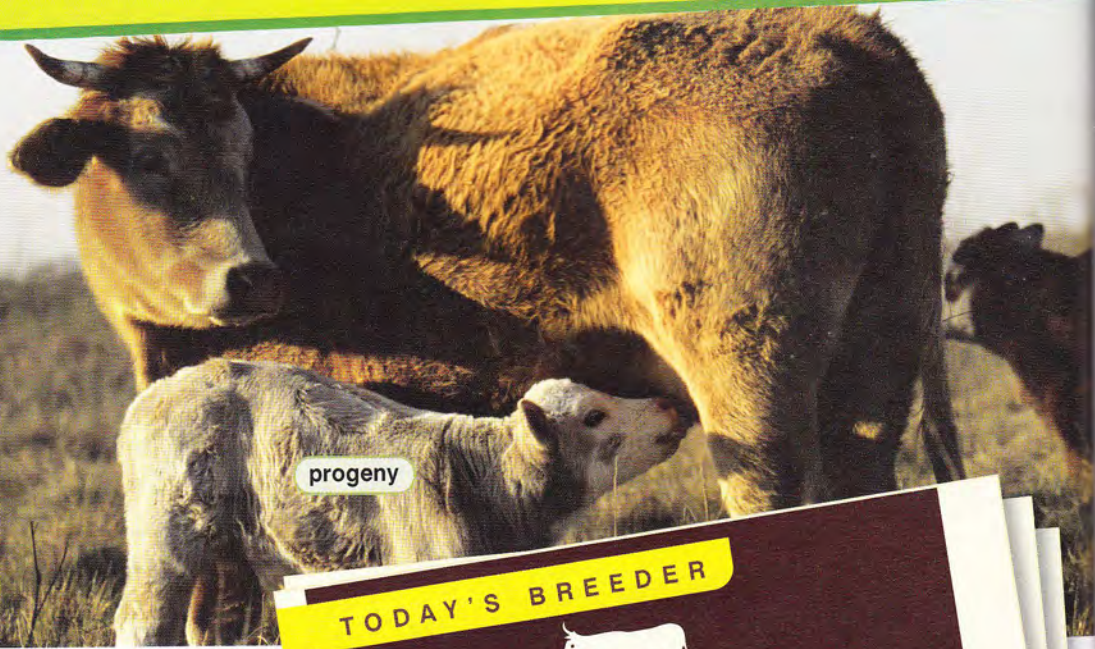
How much \_\_\_\_\_?

Thanks,

\_\_\_\_\_







progeny

### Get ready!

- 1 Before you read the passage, talk about these questions.
- 1 What traits do farmers want in different animals?
  - 2 How often do different animals breed?

### Reading

- 2 Read the notice. Then, mark the following statements as true (T) or false (F).
- 1  The company sells high quality bulls.
  - 2  The company helps customers select desirable traits.
  - 3  The computer print out details the breeding value of the steers.

### Vocabulary

- 3 Fill in the blanks with the correct words and phrases from the word bank.

#### Word BANK

breeding value    progeny  
rate of gain    heritability

- 1 Healthy breeders usually produce healthy \_\_\_\_\_.
- 2 Laura's breeding bulls have high \_\_\_\_\_.
- 3 This year's calves have a lower \_\_\_\_\_.
- 4 Each trait has a different degree of \_\_\_\_\_.

TODAY'S BREEDER



ESTABLISHED 1978

**Tom's CATTLE BREEDING Service**

Abilene, TX • (498) 555-49499

We have twenty Black Angus bulls available for breeding. Each bull has a detailed sire summary and complete pedigree. All are of high breeding value. Schedule an appointment to discuss your needs. We will help you with trait selection. We are 85% accurate in predicting heritability of most traits. Do you want a high rate of gain? Do you need strong musculature? Consider our bulls. You get a computer print out of the expected progeny difference (EPD). We can also provide information about each bull's progeny. Call us today!

- 4 Match the words (1-5) with the definitions (A-E).

- |  |   |
|--|---|
| 1 <input type="checkbox"/> breeding        | 4 <input type="checkbox"/> EPD          |
| 2 <input type="checkbox"/> pedigree        | 5 <input type="checkbox"/> sire summary |
| 3 <input type="checkbox"/> trait selection |   |

- A a line of ancestors  
B the act of mating animals  
C a rating of the likelihood that a trait will be inherited  
D a list of predictions about the passage of trait  
E the act of breeding to achieve specific traits



5 Listen and read the notice again. What does the cattle breeding service claim that it can predict?

**Listening**

6 Listen to a conversation between a breeder and a client. Choose the correct answers.

- What trait does the client want the offspring to have?
  - A strong muscles
  - B high rate of gain
  - C higher milk production
  - D increased heritability
- What does the client ask the breeder to provide?
  - A an EPD
  - B a pedigree
  - C a discount
  - D a sire summary

7 Listen again and complete the conversation.

**Breeder:** Here are pictures of all of our bulls. What traits do you want in the offspring?

**Client:** Well, I have a dairy herd. So I'd like to increase 1 \_\_\_\_\_.

**Breeder:** This Holstein 2 \_\_\_\_\_ you. Many of his progeny are prize milk cows.

**Client:** Really! Can I see his 3 \_\_\_\_\_?

**Breeder:** 4 \_\_\_\_\_ . I'll get you a copy.

**Client:** How much do you charge for breeding?

**Breeder:** 5 \_\_\_\_\_ . I give a discount for more than twenty cows.

**Client:** I see. That's 6 \_\_\_\_\_ than I need.

**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*What traits do you want?  
I'd like to increase ...  
How much do you charge for breeding?*

**Student A:** You are a cattle breeder. Talk to Student B about:

- traits
- progeny
- discounts

**Student B:** You want to breed your cattle. Answer Student A's questions.

**Writing**

9 Use the conversation from Task 8 to fill out the order with the breeder.



**Order 138**

Customer name: \_\_\_\_\_

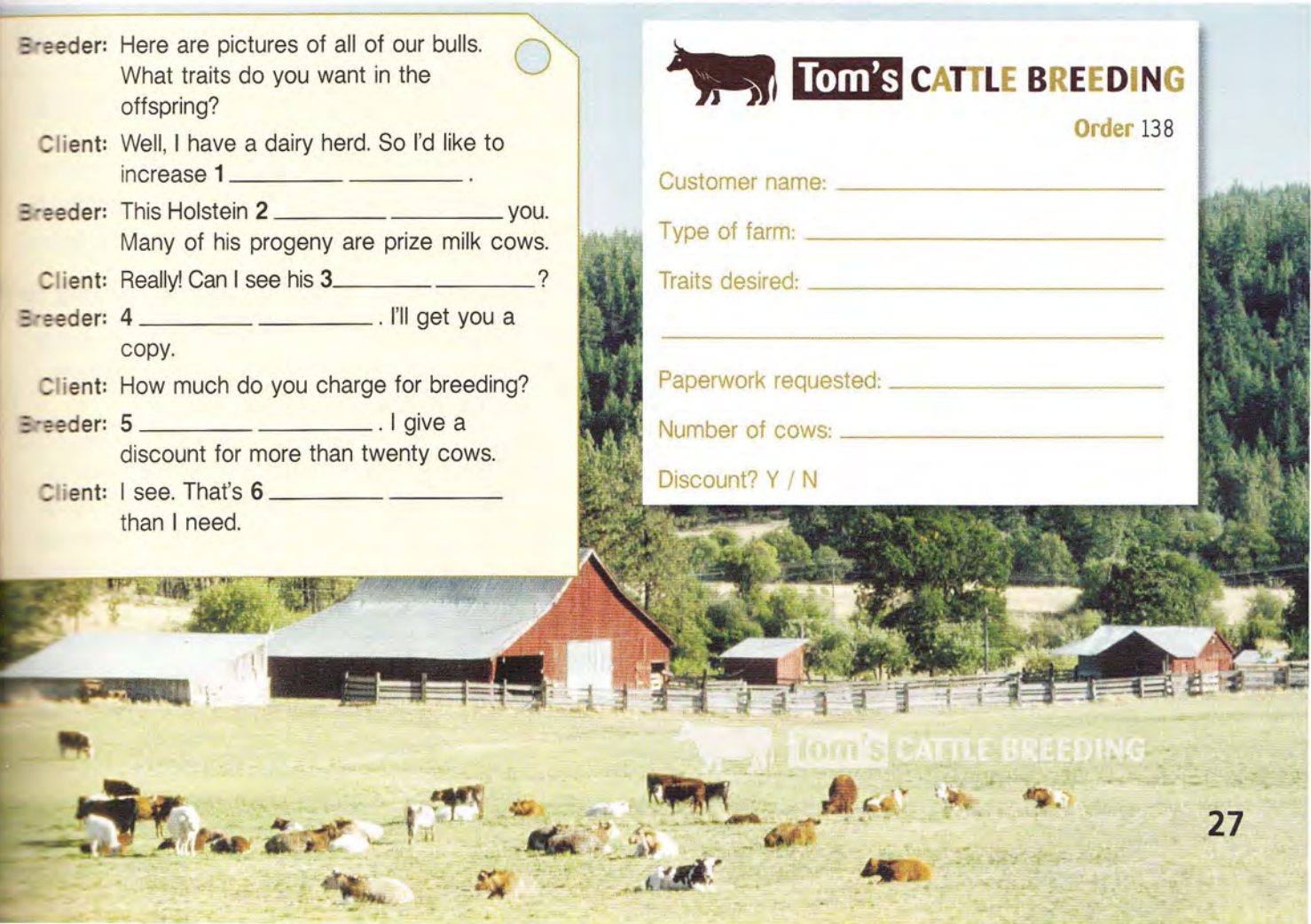
Type of farm: \_\_\_\_\_

Traits desired: \_\_\_\_\_

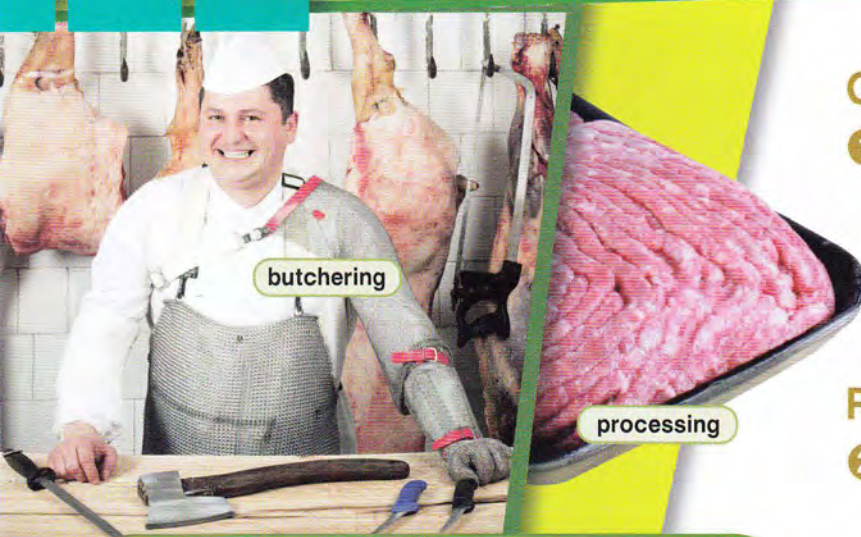
Paperwork requested: \_\_\_\_\_

Number of cows: \_\_\_\_\_

Discount? Y / N

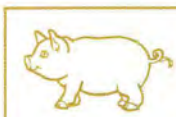






butchering

processing



Jacobson's

BUTCHERING CO.

Located at 143 First Street • 312-555-2154

At Jacobson's, we believe in **humane slaughter** and safe practices. Only trained professionals perform the slaughtering. We **inspect** all animals for disease before **butchering**.

Our **processing** fees are as follows:

**Kill fees:**

Beef: \$50/head.

Hog: \$35/head.

Lamb: \$25/head.

**Cut fees** (each cut is priced per pound):

Beef: \$.35/pound.

Hogs: \$.40/pound.

Lamb: \$.35/pound.

Not only do we process meat, but we also treat **hides**. No part of the animal is wasted. Ask about our all-natural dog and cat foods made from **offal**.

**Get ready!**

1 Before you read the passage, talk about these questions.

- 1 What are common slaughter methods?
- 2 What are the challenges of slaughtering and processing?

**Reading**

2 Read the website. Then, choose the correct answers.

- 1 Who slaughters the animals at Jacobson's?
  - A the animals' owners
  - B professional butchers
  - C the company's owner
  - D a meat inspector
- 2 What are Jacobson's cut fees based on?
  - A type of animal
  - B weight of the animal
  - C health of the animal
  - D time to process the animal
- 3 What is NOT a service offered by the company?
  - A treating hides
  - B making pet food
  - C inspection of animals
  - D delivery of meat

**Vocabulary**

3 Write a word that is similar in meaning to the underlined part.

- 1 When the animals are big enough they are killed for food or manufacture.  
s \_ \_ \_ g h \_ \_ \_ \_
- 2 Most slaughterhouses charge extra fees to prepare animals for eating or manufacturing.  
\_ r \_ c \_ \_ \_
- 3 Jonathon sent 50 animals to the slaughterhouse.  
\_ \_ \_ \_ d
- 4 Jackie learned how to use animal skins to make traditional clothing. \_ i \_ \_ \_
- 5 Mr. Randall requested several different parts of meat. \_ \_ \_ \_ s



4 Fill in the blanks with the correct words and phrases from the word bank.

**Word BANK**

butchering kill fee humane inspected offal

- 1 Wendell's Slaughterhouse has a lower \_\_\_\_\_.
- 2 Slaughterhouses must use \_\_\_\_\_ methods.
- 3 \_\_\_\_\_ is often used to make other products.
- 4 Each animal must be \_\_\_\_\_ before slaughter.
- 5 Carol thinks the cattle aren't ready for \_\_\_\_\_ yet.

5 Listen and read the website again. What happens to the parts of animals that are inedible for humans?

**Listening**

6 Listen to a conversation between a butcher and customer. Mark the following statements as true (T) or false (F).

- 1 \_\_\_ The customer needs his pigs slaughtered.
- 2 \_\_\_ Cuts are included in the kill fee.
- 3 \_\_\_ The customer wants to schedule an appointment.

7 Listen again and complete the conversation.

**Butcher:** Jacobson's Butchering Company. How may I help you?

**Customer:** Hi, I have 1 \_\_\_\_\_ that I need slaughtered.

**Butcher:** Okay, we can do that. How many are there?

**Customer:** I have twenty. What's your 2 \_\_\_\_\_ per head?

**Butcher:** For cattle? It's \$50

3 \_\_\_\_\_.

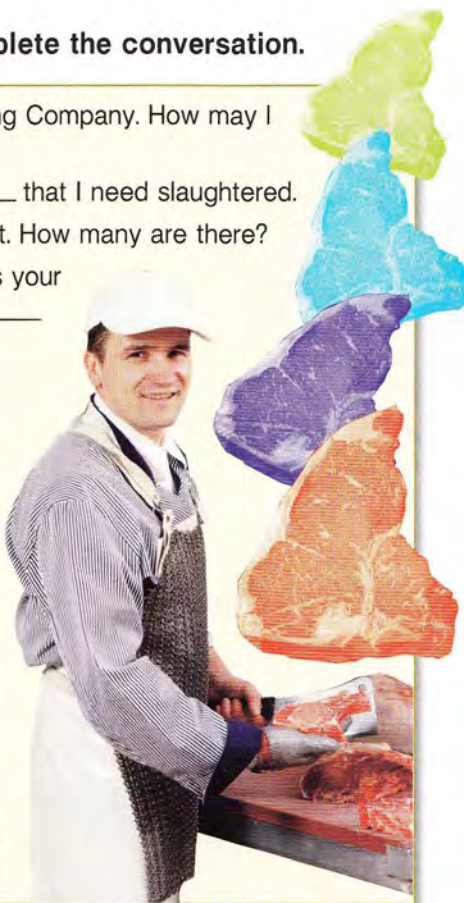
**Customer:** That's 4 \_\_\_\_\_ . Do you do cuts as well?

**Butcher:** Yes, we

5 \_\_\_\_\_ . It costs \$.35 per pound.

**Customer:** Great. 6 \_\_\_\_\_

\_\_\_\_\_ schedule an appointment.



**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*I have ... that I need slaughtered.*

*What's your kill fee?*

*Do you do cuts?*


**Student A:** You have animals you need slaughtered. Talk to Student B about:

- type of animal
- kill fees
- cuts

**Student B:** You are a butcher. Answer Student A's questions.

**Writing**

9 Use the conversation from Task 8 and the website to fill out the order summary.



**Jacobson's**  
BUTCHERING CO.  
Located at 143 First Street • 312-555-2154

**ORDER SUMMARY**

Date: \_\_\_\_\_

Type of animal: \_\_\_\_\_

Number of head: \_\_\_\_\_

Kill fee: \_\_\_\_\_

Cuts requested? Y / N

Cut price \_\_\_\_\_ per pound

Appointment scheduled for: \_\_\_\_\_





tractor



broadcast seeder



rototiller

## CLASSIFIEDS

## USED FARMING EQUIPMENT FOR SALE

Used **broadcast seeder** for sale. Spread your seeds and fertilizer with ease. It's reliable and only one year old. If interested, call and ask for Jim Drury: 617-555-3958.

Buy a 1954 John Deere **tractor**. Great pulling power! Special price if you buy our used **planter** or **transplanter**. 617-555-2156. Ask for Linda.

Want perfect soil? Buy a **rototiller** or **cultivator** for less. Both machines are hardly used. Call Dennis Fisk at 627-555-3402.

**Stone picker** for sale. Save your back and buy today! Call J. Henry: 617-555-2948.

Need a **seed drill** or **harrow** for planting? We have two great machines waiting for you. Call Maya Till at 627-555-2395.

Preparing fields? Used **chisel plow** and **cultipacker** for sale. Call 627-555-9898 for more details.

## Get ready!

## 1 Before you read the passage, talk about these questions.

- 1 What equipment is used for planting in your country?
- 2 How has modern equipment changed farming?

## Reading

## 2 Read the newspaper advertisements. Then, mark the following statements as true (T) or false (F).

- 1  The tractor has a special price with the purchase of other items.
- 2  The broadcast seeder is used to prepare fields.
- 3  The seed drill ad claims to protect the buyer's back.

## Vocabulary

## 3 Write a word that is similar in meaning to the underlined part.

- 1 That field has a lot of weeds; use the tool that breaks apart soil and weeds. c \_ l \_ \_ v \_ \_ \_ \_
- 2 Eric is plowing the field with his new that breaks apart soil and smoothes the ground. h a \_ \_ \_ w
- 3 She wants a device attached to a tractor that goes deep in the earth to turn soil. c h \_ \_ \_ \_ p \_ \_ \_
- 4 Paul got a new device pulled behind a tractor that lays down seeds in rows and covers them. \_ \_ a n \_ \_ \_
- 5 Plant the seedlings with the device pulled behind a tractor that places small plants in the soil. \_ r a n \_ \_ \_ \_ \_ \_ \_ r

## 4 Match the words (1-6) with the definitions (A-F).

- 1  rototiller
- 2  cultipacker
- 3  tractor
- 4  stone picker
- 5  broadcast seeder
- 6  seed drill

- A a device that spreads seeds and fertilizer over a field
- B a device pulled by a tractor that deposits seeds in the ground
- C a machine that turns over soil
- D a device that separates stones and soil
- E a vehicle that pulls farm equipment
- F a machine that flattens soil



- 5 Listen and read the newspaper advertisements again. What do the advertisements for farming equipment all have in common?

## Listening

- 6 Listen to a conversation between a seller and a caller responding to a used-equipment ad. Choose the correct answers.

- 1 What equipment is the caller interested in?
- A a tractor
  - B a rototiller
  - C a stone picker
  - D a transplanter
- 2 Why doesn't the buyer purchase the equipment?
- A It is too small to move his rocks.
  - B Someone else bought it already.
  - C It is too expensive for a used item.
  - D He decided to buy a new one instead.

- 7 Listen again and complete the conversation.

Caller: Hello, is Mr. Henry available?

Seller: This is Mr. Henry speaking. Can I help you?

Caller: Yes. I'm calling about your listing. The one about the 1 \_\_\_\_\_.

Seller: Oh, yes. Well, it's still available. And it's in 2 \_\_\_\_\_.

Caller: Oh, good. What 3 \_\_\_\_\_ can it move?

Seller: Anything between two and twenty five inches.

Caller: And how much is it?

Seller: 4 \_\_\_\_\_ \$4000.

Caller: That's almost the price of a 5 \_\_\_\_\_.

Seller: Well, we don't use it often.

Caller: Still, 6 \_\_\_\_\_ for me. I'll pass for now, thanks.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I'm calling about ...*

*It's in ... condition.*

*How much is it?*

**Student A:** You want to buy a piece of equipment. Talk to Student B about:

- type of equipment
- condition
- price

**Student B:** You are selling a piece of farm equipment. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the advertisement to fill out the advertisement.



### FOR SALE *Farmer's Weekly Classifieds*

Equipment for sale:

Condition:

Used for:

Price:





# 15 Harvest equipment



baler



combine harvester



gleaner



chaser bin



grain auger

## Finneman's Harvesting AND Baling

Call 482-555-2115 to schedule services

Finneman's offers a wide range of services. We provide custom harvesting and grain transportation, hay baling, and more!

Services for Grain Crops - We have the best **combine harvesters** and **gleaners** around! If you want your grain transported we can help. **Chaser bins** or **gravity wagons** transport your grain from field to storage. We have **grain augers** and **conveyor belts** for rent too! We make moving grain easy.

Silage - Our **forage harvesters** are perfect for clearing a field. Don't waste the plant remains after harvest. Rent a forage harvester and make **silage**.

Hay - We provide hay baling! We bring our **balers** to you. **Bale wrappers** are available upon request.

Don't wait for your hay to dry. Ask about our **hay conditioners**.

### Get ready!

- 1 Before you read the passage, talk about these questions.
  - 1 What types of equipment are used in harvesting?
  - 2 What are the challenges of harvesting crops?

### Reading

- 2 Read the website. Then, mark the following statements as true (T) or false (F).
  - 1  Customers can purchase grain from Finneman's.
  - 2  Silage is made from plant remains.
  - 3  Finneman's can condition wet hay.

### Vocabulary

- 3 Match the words (1-5) with the definitions (A-E).
 

1 <input type="checkbox"/> chaser bin	4 <input type="checkbox"/> combine harvester
2 <input type="checkbox"/> baler	5 <input type="checkbox"/> forage harvester
3 <input type="checkbox"/> gleaner	

  - A A machine that harvests crops of grain
  - B A harvest machine that does not use gas
  - C A cart used to carry grain from a field to storage
  - D A device that bundles hay
  - E A device that cuts up plants for use as silage

- 4 Write a word that is similar in meaning to the underlined part.
  - 1 Grain is easier to unload with an angled cart that is pulled behind a tractor.  
g \_ \_ \_ \_ \_ y    w \_ \_ o \_
  - 2 Use the device that wraps bales to keep them dry before the rain starts.  
\_ a \_ \_    \_ r \_ p \_ \_ \_
  - 3 Don't forget the device that cuts hay so it will dry quickly.    \_ \_ y    c \_ \_ \_ \_ \_ \_ n \_ r \_
  - 4 The moving strip of material that transports objects to other areas moves grain from here to the other side of the barn.  
c \_ \_ v \_ \_ \_ \_    b \_ \_ \_
  - 5 The new device that moves grain from trucks and carts into storage bins made the harvest much faster.    \_ r \_ \_ n    \_ \_ g \_ \_



5 Listen and read the website again. How does Finneman's make moving grain easy?

## Listening

6 Listen to a conversation between a farmer and an assistant. Choose the correct answers.

- 1 What is the man worried about?  
A The grain auger is not working.  
B The gravity wagons will fill quickly.  
C The combine harvesters are too slow.  
D The tractor cannot pull the wagons.
- 2 What does the boss want done by 3:00?  
A the fields completely harvested  
B the grain emptied out of the wagons  
C the equipment out in the field  
D the combine harvester hooked to the trucks

7 Listen again and complete the conversation.

Farmer: Are we ready to start harvesting, Jessica?

Assistant: I think so. The 1 \_\_\_\_\_ are in the field already.

Farmer: Good. What about the wagons?

Assistant: The 2 \_\_\_\_\_ are attached to the tractor. 3 \_\_\_\_\_.

Farmer: Great, but we only have three wagons. They'll 4 \_\_\_\_\_.

Assistant: I thought of that. I have the 5 \_\_\_\_\_ ready too.

Farmer: Excellent. I want these 6 \_\_\_\_\_ by three o'clock.

Assistant: Okay, boss. I'll let everyone know.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Are we ready to start harvesting?*

*What about the ...?*

*I have the ... ready, too.*

**Student A:** You own a harvesting company. You are about to start a harvest. Talk to Student A about:

- equipment being used
- possible problems
- time to finish

**Student B:** You are an assistant at a harvesting company. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to fill out the harvesting company's report.

Finneman's  
Harvesting

### BILL FOR SERVICES

Equipment Used: \_\_\_\_\_

Problem: \_\_\_\_\_

Solution: \_\_\_\_\_

Time finished: \_\_\_\_\_





# Glossary

- aeration** [NOUN-UNCOUNT-U4] **Aeration** is the action of exposing soil to air.
- agriculture** [N-UNCOUNT-U1] **Agriculture** is the study or process of growing plants and raising animals.
- animal nutritionist** [N-COUNT-U10] An **animal nutritionist** is a person who prepares healthy foods for animals.
- annual** [N-COUNT-U7] An **annual** is a plant that completes its life in one year.
- arid** [ADJ-U5] If an area is **arid**, it gets very little rain each year.
- bale** [N-COUNT-U15] A **bale** is a bunch of crops that is tied or bundled together.
- bale wrapper** [N-COUNT-U15] A **bale wrapper** is a farming device that wraps bales in plastic.
- baler** [N-COUNT-U15] A **baler** is a farming device pulled behind a tractor that gathers and ties cut hay or straw into rectangular bundles.
- barn** [N-COUNT-U11] A **barn** is a building where farm animals live.
- biennial** [N-COUNT-U7] A **biennial** is a plant that completes its life in two years.
- bone** [N-UNCOUNT-U3] **Bone** is the hard, white material that gives the body structure.
- branch** [N-COUNT-U7] A **branch** is a thick limb from which stems grow.
- breeding** [N-UNCOUNT-U12] **Breeding** is the act of mating plants or animals to produce offspring.
- breeding value** [N-UNCOUNT-U12] **Breeding value** is the value of an individual animal as a parent in terms of producing a specifically desired result.
- broadcast seeder** [N-COUNT-U14] A **broadcast seeder** is a farming device on the back of a tractor that spreads seeds and fertilizer.
- bud** [N-COUNT-U7] A **bud** is the small part of a plant that grows from the stem or branch and develops into a leaf or flower.
- bulk** [ADJ-U6] If an order is in **bulk**, it has a large quantity.
- bunker silo** [N-COUNT-U9] A **bunker silo** is a long, covered trench for storing agricultural products.
- bushel** [N-COUNT-U8] A **bushel** is a unit for measuring grain that is equal to approximately 35.2 liters.
- butcher** [V-T-U13] To **butcher** is to kill animals and to prepare the meat to be eaten.
- by-product** [N-COUNT-U3] A **by-product** is a leftover part of an animal that has been slaughtered.
- carbohydrate** [N-COUNT-U10] A **carbohydrate** is a substance in food that the body uses to make energy.
- cereal** [N-COUNT-U2] A **cereal** plant is one that makes grain.
- chaff** [N-UNCOUNT-U8] **Chaff** is a part of a plant that cannot be eaten or used.
- chaser bin** [N-COUNT-U15] A **chaser bin** is a cart that carries grain or corn from a field to storage.
- chisel plow** [N-COUNT-U14] A **chisel plow** is a device attached to a tractor that goes deep into the earth to turn soil.
- clay** [N-UNCOUNT-U4] **Clay** is a type of sticky soil used to make pots, bricks, or tiles.
- cold stress** [N-UNCOUNT-U11] **Cold stress** is when cold temperatures have a negative effect on animals or plants.



**combine harvester** [N-COUNT-U15] A **combine harvester** is a farming machine that harvests crops of grain.

**comfort zone** [N-COUNT-U11] A **comfort zone** is the environment in which one feels comfortable.

**conveyor belt** [N-COUNT-U15] A **conveyor belt** is a moving strip of material that transports objects to other areas.

**cool** [V-I or T-U9] To **cool** something is to decrease its temperature.

**coop** [N-COUNT-U11] A **coop** is a special building where chickens or other small animals live.

**critical temperature** [N-COUNT-U11] A **critical temperature** is a temperature above or below which some important change happens.

**crop** [N-COUNT-U1] A **crop** is a field of plants grown for food, fuel or any other economic purpose.

**cultipacker** [N-COUNT-U14] A **cultipacker** is a farming machine that flattens soil so that seeds can be planted.

**cultivate** [V-T-U1] To **cultivate** is to grow food with care.

**cultivator** [N-COUNT-U14] A **cultivator** is a farm tool that breaks apart soil and weeds so that seeds can be planted.

**cut** [N-COUNT-U13] A **cut** is meat taken from a particular area of a butchered animal.

**days to maturity** [N-COUNT-U6] **Days to maturity** are the number of days it takes a seedling to become a harvestable adult plant.

**ditch** [N-COUNT-U5] A **ditch** is a long, narrow cut in the ground used to hold or move water.

**domesticate** [V-T-U1] To **domesticate** is to tame an animal or adapt a plant for human use.

**dormancy** [N-COUNT-U6] **Dormancy** is the state of not being active now with the possibility of being active later.

**drought** [N-COUNT-U5] **Drought** is when an area gets less rain or snow than is typical.

**drought-resistant** [ADJ-U5] If a plant is **drought-resistant**, it can survive in a drought.

**dry** [V-I or T-U9] To **dry** something is to remove moisture from it.

**expected progeny difference (EPD)** [N-COUNT-U12] An **expected progeny difference** is the likelihood an offspring will inherit a particular trait from its parents.

**farm** [V-T-U1] To **farm** is to grow plants or raise animals.

**farmer's market** [N-COUNT-U2] A **farmer's market** is a market where local farmers sell produce directly to customers.

**fat** [N-UNCOUNT-U3] **Fat** is an oily substance found in plants and animals.

**feed** [N-UNCOUNT-U10] **Feed** is food given to animals.

**flowering** [ADJ-U7] If a plant is **flowering**, it produces flowers.

**forage harvester** [N-COUNT-U15] A **forage harvester** is a device attached to tractors that cuts up plants which will be turned into silage.

**fruit** [N-COUNT-U2] A **fruit** is the part of an edible plant that has seeds.

**germinate** [V-I /T-U6] To **germinate** is for a seed to begin to grow.



# Glossary

**gleaner** [N-COUNT-U15] A **gleaner** is a harvest machine that does not require gas for fuel.

**grain auger** [N-COUNT-U15] A **grain auger** is a farming device that moves grain from trucks and carts into storage bins.

**gravity wagon** [N-COUNT-U15] A **gravity wagon** is an angled cart pulled behind a tractor that allows crops to be easily unloaded.

**groundwater** [N-UNCOUNT-U5] **Groundwater** is the water that is underground.

**growth chart** [N-COUNT-U7] A **growth chart** is a graph that shows the change in growth of a population of a group of plants.

**hard coat** [N-COUNT-U6] A **hard coat** is the hard outer layer of some seeds.

**harrow** [N-COUNT-U14] A **harrow** is a plow that breaks apart soil, removes weeds, and smoothes the earth.

**harvest** [N-COUNT-U2] A **harvest** is a group of mature plants.

**harvest** [N-COUNT-U8] A **harvest** is a process of gathering crops.

**harvest** [V-I or T-U1] To **harvest** is to collect a crop.

**hay conditioner** [N-COUNT-U15] A **hay conditioner** is a farming device that cuts hay so it will dry quickly.

**head** [N-COUNT-U13] **Head** is a word used to describe groups of farm animals where each animal counts as one head.

**heat stress** [N-UNCOUNT-U11] **Heat stress** is when hot temperatures have a negative effect on animals or plants.

**hemp** [N-UNCOUNT-U2] **Hemp** is a type of plant that produces tough fibers.

**heritability** [N-UNCOUNT-U12] **Heritability** is the likelihood an offspring will inherit a trait from a parent.

**hide** [N-COUNT-U13] **Hide** is the skin of animals that can be treated and made into furniture and clothing.

**hooves** [N-COUNT-U3] **Hooves** are the hard feet of an animal.

**humane** [ADJ-U13] If slaughter is **humane**, it is done so the animal feels little pain.

**humus** [N-UNCOUNT-U4] **Humus** is a type of soil made of dead plants or other organic matter.

**hybrid** [ADJ-U6] If a plant is **hybrid**, it is made by parents of different breeds.

**industrial crop** [N-COUNT-U2] An **industrial** crop is a plant grown for manufacture or production purposes instead of food.

**inspect** [V-T-U13] To **inspect** is to carefully check products for flaws.

**irrigate** [V-T-U5] To **irrigate** is to provide water to crops.

**irrigation** [N-UNCOUNT-U1] **Irrigation** is the practice of bringing clean water to plants.

**kill fee** [N-COUNT-U13] A **kill fee** is what a farmer pays to have an animal slaughtered.

**leaf** [N-COUNT-U7] A **leaf** is the flat part of a plant that grows from the stem or branch.

**leather** [N-UNCOUNT-U3] **Leather** is animal skin that can be dried and treated and then made into clothes or furniture.

**legume** [N-COUNT-U2] A **legume** is an edible plant that has pods.



levelling [N-UNCOUNT-U9] **Leveling** is the process of flattening the top of a stored pile of grain.

loam [N-UNCOUNT-U4] **Loam** is a type of soil that has silt, clay and sand.

mature [V-I-U8] To **mature** is to become more developed.

meat [N-UNCOUNT-U3] **Meat** is the edible flesh of an animal.

melon [N-COUNT-U2] A **melon** is a large, sweet kind of fruit.

milk [N-UNCOUNT-U3] **Milk** is white liquid produced by mammals as a food source.

mineral [N-COUNT-U10] A **mineral** is an inorganic substance that can be found in food, such as potassium, that the body uses to stay healthy.

moisture [N-UNCOUNT-U9] **Moisture** refers to the tiny amounts of water in the air or on something.

mold [N-UNCOUNT-U9] **Mold** is a substance that grows on rotting organic material.

nutrient [N-COUNT-U10] A **nutrient** is any substance in food that helps plants or animals live and grow.

nutrition [N-UNCOUNT-U10] **Nutrition** is the process of nourishing an organism.

offal [N-UNCOUNT-U13] **Offal** are the parts of an animal that can't be eaten by humans.

parent material [N-COUNT-U4] **Parent material** is the rock or mineral from which soil forms.

pedigree [N-COUNT-U12] A **pedigree** is the line of relationships from an offspring to its parents and their parents and so forth.

pen [N-COUNT-U11] A **pen** is a small enclosure for farm animals.

photosynthesis [N-UNCOUNT-U7] **Photosynthesis** is a process in which a plant uses light to convert water and carbon dioxide into food.

plant [V-T-U1] To **plant** is to put seeds in the soil and help them grow.

planter [N-COUNT-U14] A **planter** is a device pulled behind a tractor that lays down seeds in rows and covers them.

poultry [N-UNCOUNT-U10] **Poultry** are domesticated birds, usually chickens and turkeys.

process [V-T-U13] To **process** is to prepare animal products for eating or manufacture.

produce [V-I or T-U1] To **produce** is to make something that can be sold.

progeny [N-COUNT-U12] **Progeny** are the descendants of a specific individual.

protein [N-UNCOUNT-U3] **Protein** is a chemical in plant or animal material that helps the body grow.

rainfall [N-UNCOUNT-U5] **Rainfall** is the amount of rain that falls on a place during a given period of time.

rain-fed [ADJ-U5] If crops are **rain-fed**, they get water from rain.

rate of gain [N-COUNT-U12] The **rate of gain** is the rate at which an offspring gains weight.

ration [N-COUNT/NONCOUNT-U10] A **ration** is a selected amount of food.

reap [V-T-U8] To **reap** a crop is to collect it from the field.



# Glossary

**rendering** [V-T-U3] To **render** animal fat is to melt it for use in a product.

**root** [N-COUNT-U7] A **root** is the underground part of a plant that draws water and minerals from the surrounding soil.

**rototiller** [N-COUNT-U14] A **rototiller** is a farming machine that turns soil so that seeds can be planted.

**sand** [N-UNCOUNT-U4] **Sand** is a type of soil made of very small pieces of rock or mineral that is often found on the beach or in the desert.

**seed** [N-COUNT-U6] A **seed** is a small, usually hard, object from which a plant grows.

**seed drill** [N-COUNT-U14] A **seed drill** is a device pulled behind a tractor that plants seeds.

**seed vigor** [N-UNCOUNT-U6] **Seed vigor** is how likely a seed is to grow and how strong its seedling will be.

**seedling** [N-COUNT-U6] A **seedling** is a baby plant that comes from a seed.

**shortage** [N-COUNT-U1] A **shortage** is a lack or lower than usual amount of something that is wanted or needed.

**silage bag** [N-COUNT-U9] A **silage bag** is large plastic bag for storing agricultural products.

**silt** [N-UNCOUNT-U4] **Silt** is made when soil mixes with a body of water and then is deposited.

**sire summary** [N-COUNT-U12] A **sire summary** is a list of genetic predictions for a male animal used for breeding purposes.

**slaughter** [V-T-U13] To **slaughter** is to kill animals for food or manufacture.

**slotted floor** [N-COUNT-U11] A **slotted floor** is a floor with long narrow holes that allow air to circulate.

**soil** [N-UNCOUNT/COUNT-U4] **Soil** is the layer of the earth's surface in which plants grow.

**soil structure** [N-COUNT-U4] **Soil structure** is how the particles in soil are connected to each other and how much space is between them.

**soil texture** [N-COUNT-U4] **Soil texture** is the classification of the size of particles within soil.

**sow** [V-T-U6] To **sow** is to plant seeds on or into the ground.

**sowing method** [N-COUNT-U6] The **sowing method** is the way in which you plant a seed.

**space requirement** [N-COUNT-U1] A **space requirement** is the amount of space an animal needs for living.

**stack** [N-COUNT-U8] A **stack** is an organized group or pile of something.

**stem** [N-COUNT-U7] A **stem** is the long, narrow part of a plant that supports the leaves and flowers.

**stone picker** [N-COUNT-U14] A **stone picker** is a farming device that separates rocks from good soil.

**storage** [N-UNCOUNT-U9] **Storage** is the act of keeping something somewhere while it is not in use.

**tallow** [N-UNCOUNT-U3] **Tallow** is fat from an animal that can be made into soap or candles.

**threshing** [N-UNCOUNT-U8] **Threshing** is the process of removing seeds or grain from a plant.

**ton** [N-COUNT-U8] A **ton** is a unit of weight measurement that is equal to 2000 pounds or 907 kilograms.

**tower silo** [N-COUNT-U9] A **tower silo** is a tall, round structure for storing agricultural products.



- tractor [N-COUNT-U14] A **tractor** is a vehicle with large wheels that pulls farm machinery.
- trait selection [N-UNCOUNT-U12] **Trait selection** is the process of breeding to achieve a certain trait or traits in the offspring.
- transplanter [N-COUNT-U14] A **transplanter** is a device pulled behind a tractor that places small plants in the soil.
- tuber [N-COUNT-U2] A **tuber** is an edible plant that grows completely underground.
- vegetable [N-COUNT-U2] A **vegetable** is part of an edible plant that doesn't have seeds.
- ventilation [N-UNCOUNT-U9] **Ventilation** is the circulation of air through an enclosed space.
- vitamin [N-COUNT-U10] A **vitamin** is an organic substance in food, such as thiamine, that the body uses to stay healthy.
- waste management [N-UNCOUNT-U11] **Waste management** is the process of storing and removing animal waste.
- water cycle [N-COUNT-U5] The **water cycle** is the continuous process of water changing form and moving on, in, and over the earth.
- water supply [N-UNCOUNT-U1] A **water supply** is the amount of clean water in one area.
- wool [N-UNCOUNT-U3] **Wool** is animal hair that you can make into clothes.
- yield [N-COUNT-U8] **Yield** is the amount or quantity of a crop that is produced.



**CAREER  
PATHS**

# Agriculture

Book  
**2**

Neil O' Sullivan  
James D. Libbin



**Express Publishing**



## Scope and sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Beef industry	Magazine article	beef, cattle, grade, herd, feedlot, grass-fed, feed ration, market weight, processing facility, antibiotics, growth hormone, feed conversion efficiency, rancher	Disagreeing with an opinion
2	Swine industry	Industry Journal	swine, hog, sow, sow farm, static space, dynamic space, social space, litter, farrow-to-nursery farm, farrow-to-finish farm	Agreeing with an opinion
3	Poultry industry	Services Webpage	poultry, intensive farming, free-range, rooster, hen, litter, broiler, roaster, hatchery, pullet, layer, primary breeder, chick	Clarifying information
4	Dairy industry	Webpage	dairy, milking parlor, pasteurize, homogenize, Holstein, heifer, calf, milking herd, udder, milk pipeline, rBST	Giving an opinion
5	Sheep industry	Business Announcement	flock, feeder lamb, market slaughter lamb, accelerated lambing, ewe, lambing period, finishing, distribute, seasonal market, confinement lamb production, range production, predation	Talking about figures
6	Equine industry	Brochure	stall, stallion, mare, broodmare, foal, preventative disease control, vaccination schedule, halter breaking, sacking out, bridling, saddling	Asking about past events
7	Apiculture	Products Webpage	beehive frame, colony, top-bar hive, skep, apiary, smoker, liquid smoke, cold smoke aerosol, honey, honeycomb, beesuit, veil	Recommending something
8	Classification and Composition	Soil Analysis Report	classification, composition, sand, silt, clay, grain, unified soil classification system, coarse-grain, fine-grain, highly-organic, peat, texture	Confirming information
9	Salts and Acidity	Newspaper Article	salinity, acidity, alkaline, sodium, sodicity, salinity, secondary salinity, dryland salinity, pH value, toxic, lime, sulpher	Checking for understanding
10	The nitrogen cycle	Textbook Passage	nitrogen cycle, fixation, mineralization, nitrification, denitrification, nutrient-poor, nitrites, nitrates, eutrophication, nitrous oxide, ammonia	Expressing confusion
11	Soil conservation	Magazine Article	soil conservation, crop rotation, cover crops, green manure, windbreaks, erosion, nutrition depletion, contour farming, keyline design, perimeter runoff control, grassway, land degradation	Describing a place
12	Preparing, seeding, and planting	Farmer's Guide	grain, top soil, fertilizer, amendment, herbicide, soil temperature, seeds per pound, no-till method, tilling method, broadcast seeding, emergence	Introducing a topic
13	Climate and Weather	Seed catalog	hardiness zone, climate, precipitation, temperature, humidity, last frost, long-range forecast, soil moisture, mulch	Asking for advice
14	Pricing	Business Letter	supply and demand, pricing, market, produce, cost of production, pricing for profit, pricing for value, pricing for competition, pricing strategy, direct marketing, indirect marketing	Expressing doubt
15	Government intervention	Newspaper Article	food and fiber industry, market demand, decline, adjusting production, price support, price floor, surplus, foreign trade enhancement, tariff, quota, fallow	Describing cause and effect

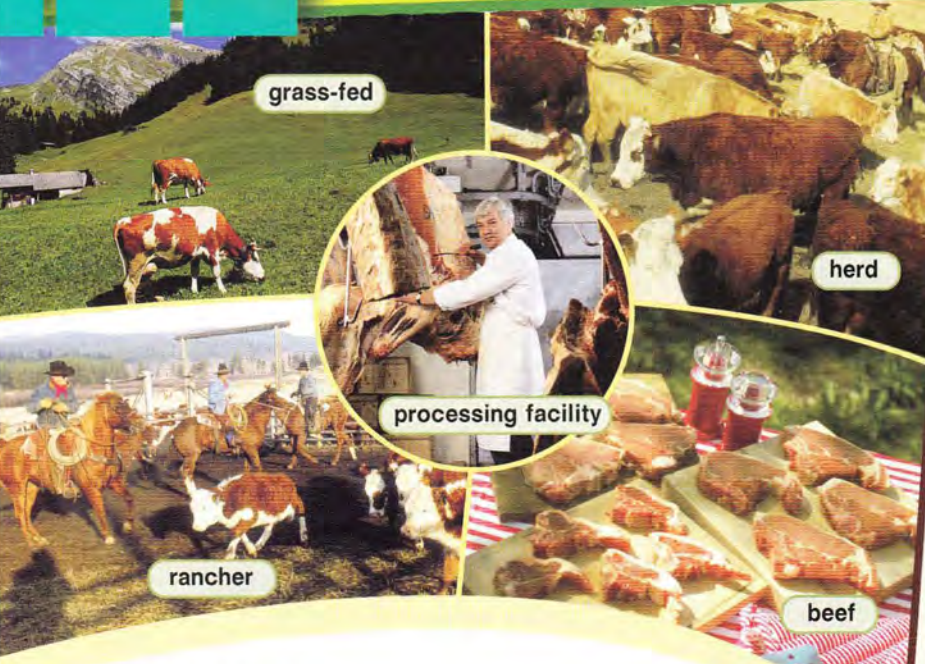


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# 1 Beef industry



Cattle Farmer Monthly June



## Is raising grass-fed cattle the way to go?

Marvin Harris

**Grass-fed beef** is in high demand. Many consumers say it tastes better than grain-fed beef. And they're willing to pay more for it. The down side of grass-fed beef is the cost. Grasses have a lower **feed conversion efficiency** than corn or soy. Cattle in pastures are also less likely to receive **growth hormones**. Thus, it takes longer for them to gain mass than their corn or soy fed counterparts. Furthermore, they do not receive **antibiotics** and can get sick more easily. Finally, corn-fed **herds** often produce higher **grades** of beef.

However, there are methods to counteract those shortcomings. Some grass-fed cattle forage in pastures for the first few years of life. Before shipping them to a **processing facility**, **ranchers** send them to a feedlot for **grain finishing**. For approximately six months they receive special **feed rations** to bring them up to **market weight** rapidly.

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How important is the beef industry in your country?
- 2 What type of meat is most popular in your country?

### Reading

2 Read the magazine article. Then, mark the following statements as true (T) or false (F).

- 1  Soy-fed cattle grow faster than grass-fed cattle.
- 2  Grass-fed herds produce higher grade beef.
- 3  Grass-fed cattle do not eat in feedlots.

### Vocabulary

3 Match the words (1-8) with the definitions (A-H).

- |                                      |   |
|--------------------------------------|---|
| 1 <input type="checkbox"/> rancher   | 5 <input type="checkbox"/> feed ration                |
| 2 <input type="checkbox"/> grass-fed | 6 <input type="checkbox"/> processing facility        |
| 3 <input type="checkbox"/> grade     | 7 <input type="checkbox"/> grain finishing            |
| 4 <input type="checkbox"/> cattle    | 8 <input type="checkbox"/> feed conversion efficiency |

- A a selected amount of food given to an animal  
 B a place where animals are butchered  
 C cows and bulls  
 D a rating of the quality of beef  
 E a measurement of how animals convert feed into mass  
 F primarily eating grass from a pasture  
 G a farmer who raises livestock  
 H feeding cattle grain to raise weight before slaughter

4 Fill in the blanks with the correct words and phrases from the word bank.

### Word BANK

growth hormones  
 feedlot antibiotics herd  
 market weight beef

- 1 The cattle in the \_\_\_\_\_ are bigger than those in the pasture.
- 2 \_\_\_\_\_ is one of the most popular sources of food for humans.
- 3 Grass-fed cattle take longer to achieve \_\_\_\_\_.
- 4 Most cattle receive \_\_\_\_\_ to keep them free of disease.
- 5 \_\_\_\_\_ help cattle grow more quickly.
- 6 Disease can spread very quickly through a \_\_\_\_\_ of cows.



5 Listen and read the magazine article again. How can farmers get around the problems related to grass-fed beef?

## Listening

6 Listen to a conversation between a rancher and her assistant. Choose the correct answers.

- What is the conversation mainly about?
  - a drop in beef prices
  - a mistake with antibiotics
  - an increase in cattle weight
  - a change in cattle raising methods
- Why does the man oppose the woman's suggestions?
  - The ranch could lose money.
  - The grass-fed trend is ending.
  - The cattle don't need antibiotics.
  - The cattle won't reach market weight.

7 Listen again and complete the conversation.

Assistant: Are you suggesting we switch to 1 \_\_\_\_\_ - \_\_\_\_\_ ?

Rancher: I'm thinking about it.

Assistant: I don't think that's a good idea. The cattle will 2 \_\_\_\_\_ to reach market weight.

Rancher: I understand that. It'll take longer and it'll cost more.

Assistant: I hope you'll 3 \_\_\_\_\_ .

Rancher: Well, 4 \_\_\_\_\_ . I'd like to stop giving them antibiotics and growth hormones, as well.

Assistant: That could be a 5 \_\_\_\_\_ . We could lose a lot of money on sick and small cows.

Rancher: I 6 \_\_\_\_\_ . But we can also charge a lot more for grass-fed, hormone-free beef.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Are you suggesting we switch to ...*  
*I don't think that's a good idea.*  
*We can charge a lot more for ...*

**Student A:** You are a rancher. Talk to Student B about:

- grass-fed cattle
- growth hormones
- costs and prices

**Student B:** You are an assistant to a rancher. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to fill out the rancher's memo. Include the reasons, costs and benefits of switching to grass-fed beef.

### Memo: All Staff Jackson Ranch

Soon, we will \_\_\_\_\_

That's because \_\_\_\_\_

This means \_\_\_\_\_

But we can also \_\_\_\_\_

Let me know if you have any questions.

\_\_\_\_\_ Owner, Jackson Ranch





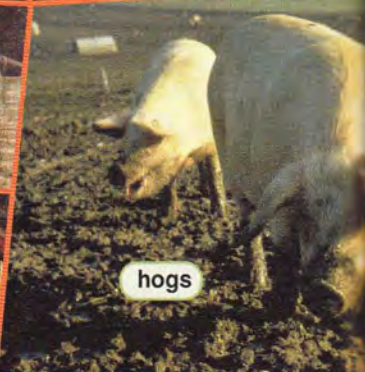
Journal of Livestock Production  
Volume, 12 Issue 4, Spring 2011

## Effective Use of Space in Swine Farming

Dr. Carol Braun and Dr. Charles Pierce

Many swine farms do not provide optimal space arrangements (Turner 2009). We studied twenty **sow farms** to learn about the best space arrangements in use today. Below are the findings from our research.

The space requirements are different depending on the type of farm. Nevertheless, it appears important to provide more than the minimally required **static space**. Otherwise, **hogs** tend to be sicker and less productive. In **farrow-to-finish farms**, providing **social space** is advisable. When **sows** have adequate social space they produce healthier **litters**. In the case of **farrow-to-nursery farms**, providing social space does not add additional value. Therefore, we found that it is sufficient to provide adequate **dynamic space**.



## Vocabulary

### 3 Match the words (1-6) with the definitions (A-F).

- |              |                            |
|--------------|----------------------------|
| 1 — hog      | 4 — dynamic space          |
| 2 — sow farm | 5 — farrow-to-finish farm  |
| 3 — litter   | 6 — farrow-to-nursery farm |

- A a group of baby pigs  
B a farm that raises female pigs  
C enough space for an animal to move  
D a farm that raises pigs to market weight  
E a pig that has achieved market weight  
F a farm that raises pigs until they are weaned

### 4 Write a word that is similar in meaning to the underlined part.

- The female pig just had another litter. \_ \_ \_ \_
- Larger pens provide space that allows animals to interact with one another. \_ o c \_ \_ \_ s \_ \_ c \_
- The amount of space required to contain an animal's body is not enough; the pig needs room to move. s t \_ \_ \_ \_ \_ p \_ \_ e
- Raising pigs and related animals is difficult. \_ w \_ \_ \_

## Get ready!

### 1 Before you read the passage, talk about these questions.

- Is the swine industry large in your country?
- What are the challenges of swine farming?

## Reading

### 2 Read the page from an agricultural industry journal. Then, mark the following statements as true (T) or false (F).

- Providing minimal static space leads to healthier hogs.
- Social space is recommended in farrow-to-finish farms.
- Farrow-to-nursery farms only need dynamic space.



5 Listen and read the page from an agricultural industry journal again. Why is it better to provide more space for hogs?

### Listening

6 Listen to a conversation between two swine farmers. Choose the correct answers.

- 1 What is the farmers' problem?
  - A There is not enough storage space.
  - B The sow pens have no static space.
  - C The sows have decreased productivity.
  - D The old barn is not big enough for the sows.
- 2 What will the farmers likely do next?
  - A increase feed rations
  - B build additional pens
  - C rearrange the sow pens
  - D move animals into the old barn

7 Listen again and complete the conversation.

Farmer 1: I'm worried. Our sows aren't as productive as they used to be.

Farmer 2: It started when we changed those pens to storage space.

Farmer 1: Yeah. The sows seem restless with less room to move around.

Farmer 2: You might be on to something. What if we increase their social space?

Farmer 1: I don't know. We don't have much room 1 \_\_\_\_\_.

Farmer 2: Well, I read an interesting article about this problem. It said social space makes a big difference in 2 \_\_\_\_\_ - \_\_\_\_\_ - \_\_\_\_\_ farms like ours.

Farmer 1: I guess we overlooked that when we used those pens for storage.

Farmer 2: Well, we can fix it. Let's get all the storage out of those pens. We can 3 \_\_\_\_\_ a few other pens so the sows can interact.

Farmer 1: That's not a bad idea.

Farmer 2: But what can we 4 \_\_\_\_\_ storage?

Farmer 1: I think we can 5 \_\_\_\_\_ in the old barn.

Farmer 2: 6 \_\_\_\_\_.

### Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

#### USE LANGUAGE SUCH AS:

*Our sows aren't as productive as ...*  
*What if we increase their social space?*  
*Well, we can fix it.*

**Student A:** You are a swine farmer. Talk to Student B about:

- sow productivity
- social space
- changing pens

**Student B:** You are a swine farmer. Discuss your sows with Student A.

### Writing

9 Use the conversation from Task 8 to describe the changes to the swine farm. Include what changes will be made and why?

Proposed Changes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Cause: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Effects: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



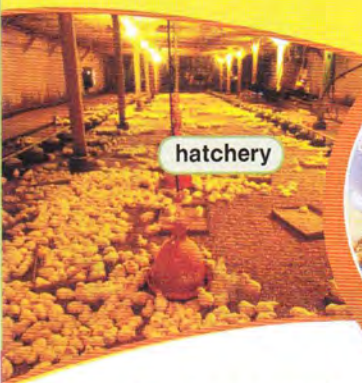




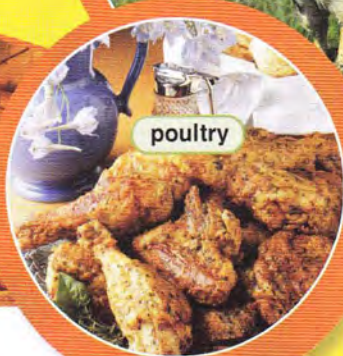
hen



rooster



hatchery



poultry

## Cluck Farms



Home About Us Our Products Rates Contact Us

Welcome to Cluck Farms. We are a **primary breeder** of twenty-seven varieties of commercial chickens.

We provide **hens** and **roosters** to over four hundred operations nationwide. Depending on your needs, we can provide you with chickens ranging from one-week old **chicks** to one-year-old **pullets**.

In addition to breeding, we operate a small production facility. Our **layers** produce only the best eggs. All of our **broilers** and **roosters** are raised in a **free-range** manner.

We are available to consult with **poultry** operations in neighboring states. With sixty years' experience, we can advise you on **intensive** farming methods, free-range techniques, and effective **litter** removal. Call us today to take a tour of our **hatcheries**.

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What products come from the poultry industry?
- 2 How common is poultry in your country?

### Reading

2 Read the page from a website. Then, choose the correct answers.

- 1 What is the purpose of the website?
  - A to describe a business
  - B to explain product prices
  - C to compare breeding methods
  - D to give advice on chicken farming
- 2 Which type of chicken produces eggs?
 

A pullets	C layers
B roasters	D roosters
- 3 Which service is NOT provided by the farm?
  - A consultation for nearby farms
  - B breeding of commercial chickens
  - C production of poultry products
  - D removal of farm litter



chick

### Vocabulary

3 Match the words (1-7) with the definitions (A-G).

- |              |                        |
|--------------|------------------------|
| 1 __ rooster | 5 __ chick             |
| 2 __ layer   | 6 __ hatchery          |
| 3 __ hen     | 7 __ intensive farming |
| 4 __ broiler |                        |

- A a baby chicken
- B a female chicken that produces eggs
- C a female chicken
- D a male chicken
- E a facility where eggs are hatched
- F a medium-sized chicken sold for food
- G a method for raising chicken indoors



4 Fill in the blanks with the correct words and phrases from the word bank.

**Word BANK**

free-range    roasters    primary breeder  
poultry    litter    pullets

- 1 \_\_\_\_\_ chickens exercise more than confined chickens.
- 2 \_\_\_\_\_ is the waste produced in a coop.
- 3 Robert's Farm is the \_\_\_\_\_ for most local farms.
- 4 Chicken is a major \_\_\_\_\_ product.
- 5 \_\_\_\_\_ cost a lot because they are so big.
- 6 Those \_\_\_\_\_ will be layers soon.

5 Listen and read the page from a website again. Apart from breeding, what other services does Cluck Farms provide?

**Listening**

6 Listen to a conversation between a breeder and a farmer. Mark the following statements as true (T) or false (F).

- 1 \_\_\_ The farmer wants advice on raising free-range chickens.
- 2 \_\_\_ The breeder recommends two chicken breeds.
- 3 \_\_\_ The farmer will buy a dozen roasters.

7 Listen again and complete the conversation.

Farmer: Hi, I'd like to order some chicks.  
 Breeder: Is there a particular breed you're interested in?  
 Farmer: I'm 1 \_\_\_\_\_. I have a small farm, and I'd like to raise a dozen or so chickens 2 \_\_\_\_\_ - \_\_\_\_\_.  
 Breeder: Well, we have a few good 3 \_\_\_\_\_. Meat or egg production?  
 Farmer: Could you 4 \_\_\_\_\_ ?  
 Breeder: Are the chickens going to be used for meat or egg production?  
 Farmer: 5 \_\_\_\_\_. I want the hens to lay eggs for a few years. But I'll occasionally slaughter them for meat. Maybe one or two a year.  
 Breeder: In that case, I'd recommend Iowa Blue or Delaware. Both produce excellent eggs and grow into 6 \_\_\_\_\_ quickly.  
 Farmer: Did you say roasters or roasters?  
 Breeder: Roasters. Both breeds can grow rather large. They make good roaster chickens.  
 Farmer: Oh, I see. Well then, I'll take a half dozens chicks of each.

**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*Hi, I'd like to order some chicks.*  
*Are the chickens for meat or egg production?*  
*I'll take a half dozen.*


**Student A:** You are a breeder. Talk to Student B about:

- production
- types of chicks
- chick growth

**Student B:** You want to raise chickens. Talk to Student A about which type to buy.

**Writing**

9 Use the conversation from Task 8 to fill out the order.

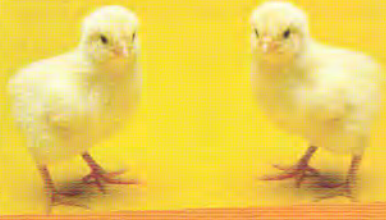
**Cluck Farms** 

Customer Name: \_\_\_\_\_

Chicks for: Meat / Egg

Breeds: \_\_\_\_\_

Number of Chicks: \_\_\_\_\_





## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What dairy products are popular in your country?
- 2 How has technology changed dairy production?

## Reading

2 Read the page from a website. Then, mark the following statements as true (T) or false (F).

- 1  The dairy receives calves from a breeder.
- 2  The dairy produces more than milk.
- 3  The milk at the farm is tested for rBST.

## Vocabulary

3 Fill in the blanks with the correct words and phrases from the word bank.

## Word BANK

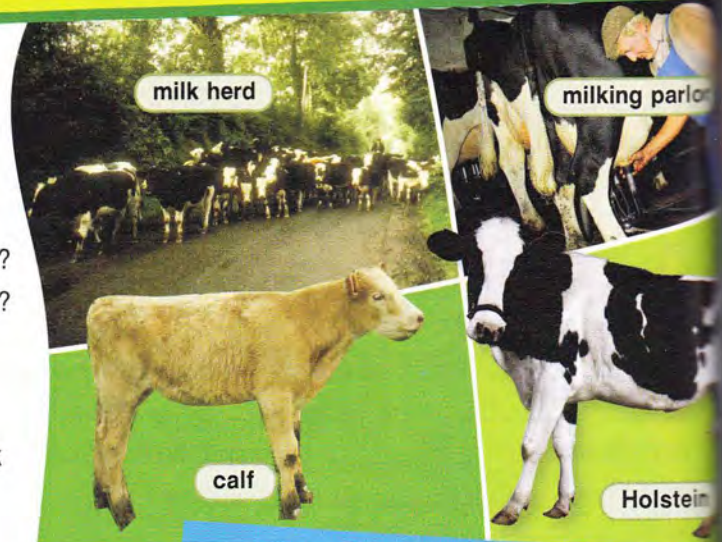
homogenized    Holstein    udders  
rBST    milk pipeline

- 1 Most people prefer milk that is \_\_\_\_\_.
- 2 Machines pull milk from cows' \_\_\_\_\_.
- 3 \_\_\_\_\_ makes cows produce more milk.
- 4 The \_\_\_\_\_ carries milk to storage.
- 5 \_\_\_\_\_ cows are known as great milk producers.

4 Match the words (1-6) with the definitions (A-F).

- |                                   |   |
|-----------------------------------|---|
| 1 <input type="checkbox"/> dairy  | 4 <input type="checkbox"/> milking parlor |
| 2 <input type="checkbox"/> heifer | 5 <input type="checkbox"/> pasteurize     |
| 3 <input type="checkbox"/> calf   | 6 <input type="checkbox"/> milking herd   |

- A a female cow that has not given birth  
 B food made from milk  
 C an area where cows are milked  
 D to heat milk in order to kill bacteria  
 E a group of cows that produce milk  
 F a baby cow



## Colchester Family Dairy Farm

### About Us

Colchester Family Dairy Farm is located in Bemville, Ohio. Founded in 1882 by Roger Colchester, our farm is still run by the Colchester family.



*Our facilities* - Our main barn houses a **milk herd** of 75 **Holsteins**. In addition, we have a nursery barn where bull **calves** and **heifers** are raised until they are sold. The milking machines in our **milking parlor** are the best available. They can send fifty gallons a minute from **udders** to storage through our **milk pipeline**.

*What we do* - Our farm produces milk and milk products, none of which contain **rBST**. We sell four varieties of milk and make our own cheese and butter.

*Our commitment to quality* - Every gallon of milk produced at our farm is **pasteurized** and **homogenized**. We test each batch for quality. If it doesn't pass our rigorous testing, we don't sell it.



5 dairy





🔊 Listen and read the page from a website again. What happens to milk that has passed through the pipeline?

### Listening

🔊 Listen to a conversation between two dairy employees. Choose the correct answers.

- What is the problem with the heifer?
  - A She does not produce enough milk.
  - B She is too old to have a calf.
  - C She is underweight for a milk cow.
  - D She does not get enough to eat.
- When will the heifer move to the milk herd?
  - A when her calf is weaned
  - B when she gains weight
  - C when she is healthy again
  - D when she gets old enough

🔊 Listen again and complete the conversation.

**Employee 1:** I think it's time for this heifer to leave the nursery barn.

**Employee 2:** Really? Do you think she's ready to join the milk herd?

**Employee 1:** I do. She's been in the heifer herd for a pretty long time.

**Employee 2:** That's true. But I don't think she's ready to have a calf.

**Employee 1:** Why do you say that? She's almost two years old. That's the right age, if you ask me.

**Employee 2:** Well, age is important, but it's not **1** \_\_\_\_\_ . Have you weighed her lately?

**Employee 1:** No, I haven't. Is there a problem **2** \_\_\_\_\_ ?

**Employee 2:** It's not a problem, exactly. It's just that she's not quite **3** \_\_\_\_\_ to join the milk herd.

**Employee 1:** **4** \_\_\_\_\_ . But we need to get her weight up, then. Have you increased her feed rations?

**Employee 2:** No, we haven't.

**Employee 1:** Let's start with that. If we can get another twenty or thirty **5** \_\_\_\_\_ , we'll move her into the milk herd. **6** \_\_\_\_\_ ?

**Employee 2:** Yes, that's a good plan.

### Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*I think it's time this heifer ...*  
*I don't think she's ready to ...*  
*If we can ... we'll ...*

**Student A:** You are a dairy farmer. Talk to Student B about:

- moving a heifer to the milk herd
- heifer age and weight

**Student B:** You are a dairy farmer. Talk to Student A about moving a heifer to the milk herd.

### Writing

9 Use the conversation from Task 8 to write a plan to move the heifer.

**Heifer 1187**

Age: \_\_\_\_\_

Weight: \_\_\_\_\_

Goal: \_\_\_\_\_

Changes: \_\_\_\_\_

Will move to milking herd when: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# Cloudhaven Sheep Farm



Galton Industries is proud to introduce our newest venture, the Cloudhaven Sheep Farm. Building on our success with the Cloudhaven Cattle Yard, we have created a lambing facility that offers the same quality production. Cloudhaven oversees three **flocks**, combining for a total of approximately 3,000 head of sheep. We supply both **feeder lambs** and **market slaughter lambs**. Thanks to our **accelerated lambing** process, we can meet the demands of any customer, large or small. Our **ewes** produce one to two lambs per year. During each **lambing period**, we keep half of the lambs for **finishing**. The others are **distributed**

to meet **seasonal market** demands.

This is all made possible by our system of **confinement lamb production**. Our experienced managers ensure the safety and quality of lambs inside our facility. Not only does this process increase quality, but it also helps keep our costs down. Unlike **range production** operations, confinement production means we have zero losses to **predation**. And we pass those savings on to our customers. So, come see us at Cloudhaven Sheep Farm for quality sheep at low prices.

## Get ready!

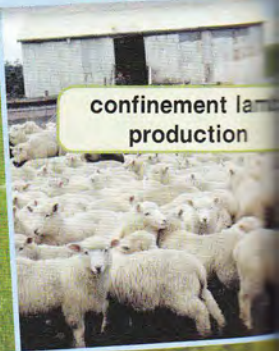
1 Before you read the passage, talk about these questions.

- How is raising sheep different from raising cattle?
- Are sheep raised mostly for meat or wool in your country?

## Reading

2 Read the business announcement. Then, choose the correct answers.

- What is the passage mostly about?
  - a takeover of a failing sheep operation
  - the advantages of range production
  - the success of a cattle operation
  - the operations of a new facility
- What was the company's previous business venture?
  - a cattle yard
  - a slaughterhouse
  - a free range poultry operation
  - a meat processing facility
- What is the advantage of confinement lamb production?
  - production of more lambs
  - no predation losses
  - accelerated lambing process
  - better market prices



## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                   |                                   |
|-------------------|-----------------------------------|
| 1 ___ flock       | 5 ___ market slaughter lamb       |
| 2 ___ ewe         | 6 ___ confinement lamb production |
| 3 ___ distribute  |                                   |
| 4 ___ feeder lamb |                                   |

- a large group of domesticated sheep
- a method for raising sheep indoors
- a lamb that is sold to be slaughtered
- a lamb that is sold for finishing
- to supply goods to shops to be sold
- a female sheep



4 Read the sentence pair. Choose where the words best fit the blanks.

1 seasonal market / accelerated lambing

A The farm produced more lambs for the \_\_\_\_\_.

B Weak ewes cannot participate in \_\_\_\_\_.

2 lambing period / finishing

A Lambs are put up for sale after \_\_\_\_\_.

B Ewes need extra care during the \_\_\_\_\_.

5 Listen and read the business announcement again. What happens to the lambs during the lambing period?

## Listening

6 Listen to a conversation between a customer and a sheep farm employee. Mark the following statements as true (T) or false (F).

1 \_\_\_ The woman wants market slaughter lambs.

2 \_\_\_ The sheep farm cannot complete orders over 300 lambs.

3 \_\_\_ Lamb prices are determined by weight.

7 Listen again and complete the conversation.

Employee: Cloudhaven Sheep Farm. This is Michael speaking. How can I help you?

Customer: Hi, Michael. My farm is expanding operations, and we're looking to get some 1 \_\_\_\_\_.

Employee: Well, we can certainly provide that. About how many animals are you 2 \_\_\_\_\_?

Customer: I'd like 3 \_\_\_\_\_ 300 head. Can you complete an order that large?

Employee: 4 \_\_\_\_\_. We try to keep a steady population of about 3,000. Of course, only 4 of those are feeder lambs. The rest are 5 \_\_\_\_\_.

Customer: I see. Well, 6 \_\_\_\_\_. In that case, let's talk about prices.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*My farm is expanding. We're looking to get ...*

*Can you complete an order that large?*

*Let's talk about prices.*

**Student A:** You want to purchase sheep for your farm. Ask Student B about:

- the type of lambs you want
- the number of lambs
- prices

**Student B:** You are a sheep breeder. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to fill out the receipt.

Cloudhaven  
Sheep Farm



### SALES RECEIPT

#### Customer Information

Name: \_\_\_\_\_

Farm: \_\_\_\_\_

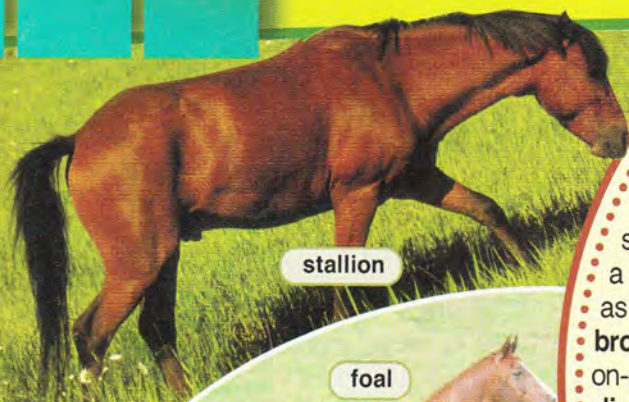
#### Order Details

Lamb Type: \_\_\_\_\_

# of Lambs: \_\_\_\_\_

Price per pound: \_\_\_\_\_

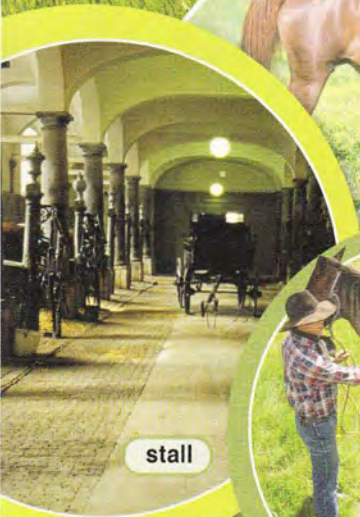




stallion



foal



stall



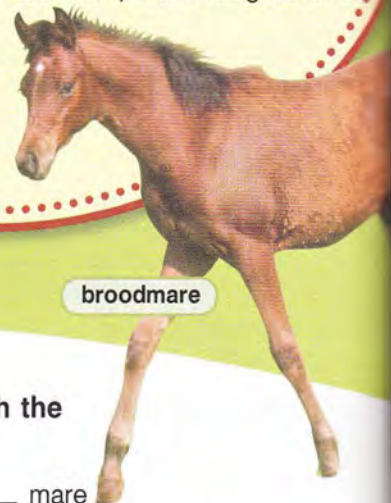
saddling

## Shady Stables

Shady Stables is East City's premier equestrian facility. Our ten-acre property features two barns with eight stalls in each. Every stall is connected to a private run. We board stallions and mares for a small monthly fee that includes feed and access to all our riding areas as well as local riding trails. We also have private boarding areas for broodmares and foals. In addition to our boarding services, we have an on-site veterinarian to meet all of your horse's needs including preventative disease control. Routine care includes foot and dental exams and a comprehensive vaccination schedule.

Shady Stables also offers professional training services. Our trainers can assist you with everything from halter breaking and sacking out to bridling and saddling. Each trainer has a minimum of five years' experience training horses. They also offer private riding lessons for inexperienced riders.

Call Shady Stables today to learn more about our facilities and staff.



broodmare

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What role have horses played in agriculture in the past?
- 2 How are horses used in your country today?

### Reading

2 Read the brochure from a horse stable. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ The monthly boarding fee includes food.
- 2 \_\_\_ The facility is near a veterinary clinic.
- 3 \_\_\_ Trainers have years of experience teaching new riders.

### Vocabulary

3 Match the words (1-7) with the definitions (A-G).

- |                |                                    |
|----------------|------------------------------------|
| 1 ___ bridling | 5 ___ mare                         |
| 2 ___ foal     | 6 ___ halter breaking              |
| 3 ___ stallion | 7 ___ preventative disease control |
| 4 ___ saddling |                                    |

- A training a horse to be led by a halter  
 B a baby horse  
 C a female horse  
 D training a horse to accept a saddle  
 E training a horse to accept a bit  
 F a male horse  
 G activities that prevent illnesses

4 Write a word that is similar in meaning to the underlined part.

- 1 The female horse used for breeding is pregnant again. b r \_ \_ \_ \_ a \_ \_
- 2 Training a horse to not fear objects that humans place on it can be dangerous. \_ a \_ k \_ \_ \_ \_ u \_
- 3 The veterinarian created a planned administration of vaccinations. \_ \_ c c \_ \_ \_ t \_ \_ \_ \_ \_ c h \_ \_ \_ \_ \_
- 4 Clean the small partitions inside a barn. \_ t \_ \_ \_ \_



- 5 Listen and read the brochure from a horse stable again. What service do they offer for less experienced riders?

## Listening

- 6 Listen to a conversation between two horse trainers. Choose the correct answers.

- 1 What did the woman do with the mare?  
 A bridled her  
 B saddled her  
 C sacked her out  
 D rode her
- 2 What will the woman do tomorrow?  
 A give the mare a shot  
 B talk to the veterinarian  
 C check the vaccination schedule  
 D put a saddle on Snowflake

- 7 Listen again and complete the conversation.

- Trainer 1: Did you work with Snowflake today?  
 Trainer 2: I did. And 1 \_\_\_\_\_  
 \_\_\_\_\_, I think she's one of the best mares we've got.
- Trainer 1: Really? Why do you say that?  
 Trainer 2: Well, just yesterday I started 2 \_\_\_\_\_.  
 She didn't seem scared at all when I put the blanket on her.
- Trainer 1: That's rare. 3 \_\_\_\_\_ today?  
 Trainer 2: The same thing happened today. You know, I think she might be ready for 4 \_\_\_\_\_.
- Trainer 1: Have you 5 \_\_\_\_\_ yet?  
 Trainer 2: No. I guess I should probably work on that before I try to 6 \_\_\_\_\_.
- Trainer 1: Definitely. And that reminds me, she needs to see the vet.



## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Did you work with ... today?*  
*I think she might be ready for ...*  
*She needs to see the vet.*

**Student A:** You are a horse trainer. Ask Student B about:

- a mare
- training
- vaccination

**Student B:** You are a horse trainer. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 to fill out the training log.

### RIDER'S STABLES TRAINING LOG

Horse: \_\_\_\_\_

Trainer: \_\_\_\_\_

Date: \_\_\_\_\_

Training completed: \_\_\_\_\_

Trainer assessment of horse: \_\_\_\_\_

Next training: \_\_\_\_\_

Medical status of horse: \_\_\_\_\_





# 7 Apiculture



Home About Us Products Orders Contact

## Sweet Rewards Beekeeper Supply

Whether you're considering beekeeping as a hobby or a career, Sweet Rewards Beekeeper Supplies has everything you need. We carry a wide selection of **beehive frames** to house your **colony**. From **top-bar hives** to traditional **skeps**, we have hives for any type of **apiary**.

In addition to hive frames, we also carry a complete line of beekeeper tools. We have several sizes of **smokers**, as well as **liquid smoke** and **cold smoke aerosols**. When it's time to harvest **honey**, take advantage of our new line of honey jars. We even serve beekeepers who prefer traditional methods. For these customers, we carry **honeycomb** presses.

Finally, no beekeeping operation is complete without protective gear. We have **beesuits** in a variety of sizes and designs including square veils, round veils, and shoulder veils.

Stop in today and see what makes Sweet Rewards the first choice for professional beekeepers.



beesuit



veil



honey



honeycomb press



smoker



top-bar hive

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What challenges do beekeepers face?
- 2 Why is beekeeping important today?

### Reading

2 Read the webpage. Then, choose the correct answers.

- 1 Which product do bees live in?
 

A apiary	C beehive frame
B beesuit	D honeycomb press
- 2 What is true of the honeycomb press?
 

A It protects beekeepers.
B It supports large colonies.
C It is preferred by professionals.
D It is used by traditional beekeepers.
- 3 What does the store NOT sell?
 

A bee colonies	C harvest equipment
B smoking tools	D protective clothing

### Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **apiary / beesuit**

A This _____ produces a lot of honey.
B A good _____ protects beekeepers' skin.
- 2 **liquid smoke / colony**

A Wendy's _____ lives in a top-bar hive.
B _____ is a good option for people who dislike the smell of smoke.
- 3 **veils / skeps**

A There are many types of protective _____.
B Traditional beekeepers use _____.



3 Match the words (1-6) with the definitions (A-F).

- 1 \_\_\_ smoker
- 2 \_\_\_ honey
- 3 \_\_\_ honeycomb
- 4 \_\_\_ top-bar hive
- 5 \_\_\_ beehive frame
- 6 \_\_\_ cold smoke aerosol

- A a structure that houses a bee colony
- B a structure with a bar that bees build their colony on
- C a pressurized container that releases smoke
- D a structure with six-sided cells
- E a sweet substance that bees make
- F a device that burns materials to produce smoke

5 Listen and read the webpage again. What do they suggest every beekeeping operation must have?

Listening

6 Listen to a conversation between a employee and customer. Mark the following statements as true (T) or false (F).

- 1 \_\_\_ The man wants to purchase a wooden beehive frame.
- 2 \_\_\_ The woman recommends liquid smoke.
- 3 \_\_\_ Cold smoke aerosols do not damage wooden frames.

7 Listen again and complete the conversation.

Employee: Can I help you find anything today?  
 Customer: Yes, I'm looking for liquid smoke.  
 Employee: That's right over here by the smokers. Can I ask what type of apiary you have?  
 Customer: I just got a wooden beehive frame. Why do you ask?  
 Employee: Well, 1 \_\_\_\_\_ can be a problem with wooden hives.  
 Customer: Really? 2 \_\_\_\_\_?  
 Employee: It leaves stains on wood. Also, you have to be really careful when you use it. The liquid can ruin your honey.  
 Customer: Oh, that's 3 \_\_\_\_\_. Is there something else that you'd 4 \_\_\_\_\_?  
 Employee: 5 \_\_\_\_\_ cold smoke aerosols.  
 Customer: Will those stain the wood in my hive?  
 Employee: No. But you still need to be careful and avoid spraying them into the 6 \_\_\_\_\_.

Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

*I'm looking for ...*  
*Can I ask what type of apiary you have?*  
*The liquid can ruin your honey.*

**Student A:** You work in a beekeeping supply store. Ask Student B about:

- help finding items
- type of apiary
- types of smokers

**Student B:** You are a beekeeper. Answer Student A's questions.

Writing

9 Use the conversation from Task 8 to fill out the customer's notes. Include information on types of smokers and using them safely.

Notes on smokers

Types: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 Instructions for use: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_





silt



highly-organic



peat



sand

KCI Laboratories

## Soil Analysis Report

Prepared for: Sam Jones / Prepared by: Kim Horton

We took soil samples from three proposed farm locations. See the chart below for details.

The samples indicate substantially different soils at each location. The table below summarizes the texture, composition, and classification of the samples. No **highly-organic** soils were found. Both sites 01 and 02 offer desirable soil. However, in both cases we recommend adding **peat**. That will make them more suitable for agriculture. The soil at Site 02 is not suitable for irrigated agriculture.

Sample	Grain texture	Composition			Unified Soil Classification System Symbol/ Group Name
		% sand	% silt	% clay	
Site 01	fine-grained	5	15	80	CL/ clay
Site 02	coarse-grained	75	21	4	SM/ silty sand
Site 03	medium-grained	2	68	32	MH/ elastic silt

## Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 **highly-organic / coarse-grained**

A \_\_\_\_\_ soil is best suited for farming.

B Growing crops in \_\_\_\_\_ soil is difficult.

2 **peat / clay**

A \_\_\_\_\_ makes soil more fertile.

B \_\_\_\_\_ is much more dense than sand.

3 **unified soil classification system / composition**

A Each soil type has a different \_\_\_\_\_.

B Soil types are organized by the \_\_\_\_\_.

4 Match the words (1-6) with the definitions (A-F).

1 \_\_\_ sand

4 \_\_\_ classification

2 \_\_\_ silt

5 \_\_\_ fine-grained

3 \_\_\_ grain

6 \_\_\_ texture

A soil deposited by water

B consisting of tiny particles

C a small piece of material

D group something belongs to

E how something feels

F soil made of rock and minerals

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What types of soil are there?
- 2 How does soil type affect crop growth?

## Reading

2 Read the soil analysis report. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ No site had the same grain texture.
- 2 \_\_\_ Sites 01 and 03 had highly-organic soil.
- 3 \_\_\_ Adding peat to Site 02 will make it suitable for irrigated farming.



- 5 Listen and read the soil report again. Which site would not be a good location for a farm?

## Listening

- 6 Listen to a conversation between a scientist and a farmer. Choose the correct answers.

- Why does the farmer call the scientist?
  - to ask for advice on which field to plant
  - to discuss the soil analysis results
  - to point out an error in the report
  - to request a second analysis
- When would the field need to be irrigated?
  - when the soil became sandy
  - when wheat is planted there
  - when there is below average rainfall
  - when clay is present in the soil

- 7 Listen again and complete the conversation.

**Scientist:** Hello, KCI Laboratories, Kim Horton speaking.

**Farmer:** Hi, Kim. This is Sam Jones at Breyton Farming. I just looked over the results from the soil analysis you sent.

**Scientist:** Do you have any questions?

**Farmer:** Actually, yes, I do. Just so I'm clear, the sample from the north field had a lot of clay in it.

**Scientist:** That's correct.

**Farmer:** So if I planted wheat there, it would 1 \_\_\_\_\_ well.

**Scientist:** Yes. It has very 2 \_\_\_\_\_ - \_\_\_\_\_ clay. So when it rains, the soil will hold the water very well.

**Farmer:** If I 3 \_\_\_\_\_, then I wouldn't need to irrigate that field.

**Scientist:** That's correct. 4 \_\_\_\_\_ the rainfall is normal.

**Farmer:** Of course. There's 5 \_\_\_\_\_ . The east field sample showed it's very sandy. I just want to 6 \_\_\_\_\_ that I can irrigate there.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Do you have any questions?*

*The sample from the north field has ...*

*I just want to make sure that I can ...*

**Student A:** You are a farmer who received a soil analysis. Ask Student B about:

- clay in fields
- sand in fields
- irrigation

**Student B:** You are a scientist who analyzed the soil. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 to fill out the farmer's notes.

### Soil Composition

North field soil type: \_\_\_\_\_

North field water/irrigation requirements:  
 \_\_\_\_\_  
 \_\_\_\_\_

East field soil type: \_\_\_\_\_

East field water/irrigation requirements:  
 \_\_\_\_\_  
 \_\_\_\_\_





sulfur

THE MIDLAND HERALD

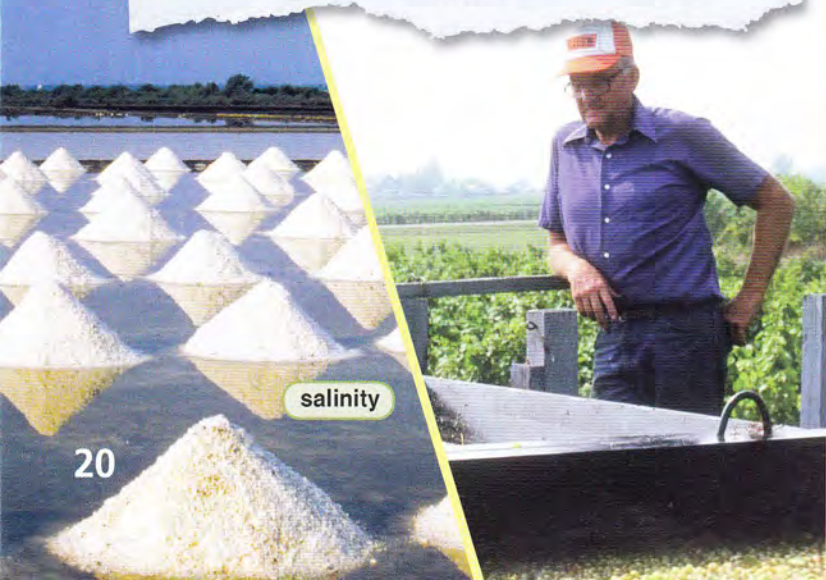
MONDAY AUGUST, 14

## Farmers Struggle against Salt and Acid

WAYNESBORO - Martin Harrison has been a farmer for half a century. Recently, his crops have grown poorly. The culprit: rising **salinity** and **acidity** along with decreasing **sodicity**.

Harrison's farm is located in Brown County, an area known for its rich farmland with little risk for salinity problems. Historically, the **primary salinity** of the soils there was low. That started to change two years ago when drought arrived. Farmers began irrigating their fields with well water. That water has high potassium, chloride, and **sulfur** content. At first there were no problems. However, mineral deposits built up. This resulted in the increased **secondary salinity** of the soil. It also made the soil acidic and **alkaline**.

Harrison started to notice problems last summer. His tomato plants died. The soil had become **toxic** to several other vegetables as well. He now increases the soil's **pH value** by adding **lime**. But that is just a temporary solution to the problems caused by irrigation. Until the drought ends, crop yields will suffer.



salinity

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How does salt get into soil?
- 2 How can farmers reduce acid levels in soil?

### Reading

2 Read the newspaper article. Then, choose the correct answers.

- 1 What changed the soil's primary salinity?
  - A saline deposits in the soil
  - B acids from rainwater
  - C minerals from well water
  - D toxins from fertilizer
- 2 How does the farmer improve his soil?
  - A He plants fewer crops.
  - B He adds lime to the soil.
  - C He irrigates in the summer.
  - D He increases the salinity.
- 3 When can you infer the crops will grow properly again?
  - A when farmers can stop irrigating
  - B when the pH value of the soil is lowered
  - C when sulfur content in the soil increases
  - D when farmers purify the well water

### Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |              |                      |
|--------------|----------------------|
| 1 — acidity  | 4 — primary salinity |
| 2 — alkaline | 5 — lime             |
| 3 — sodicity |                      |

- A the amount of sodium in the soil
- B the amount of acid in the soil
- C a substance added to improve soil
- D salt that is in soil from natural processes
- E having a pH value greater than 7.0



3 Write a word that is similar in meaning to the underlined part.

- Plants won't grow in soil with too much alkaline metal.    \_ \_ \_ i \_ m
- Some substances are harmful to plants.    t \_ \_ \_ c
- Irrigation leads to an increase in the salt level changed by land use and management.    \_ \_ c o n \_ \_ \_ \_ s \_ l \_ \_ \_ \_
- Chemicals can alter soil's measure of acidity or alkalinity.    \_ H \_ a \_ \_ \_
- The soil has high metallic element levels.    \_ u l \_ \_ \_
- What is the concentration of salt of the soil?    s \_ \_ \_ \_ \_ t \_

6 Listen and read the newspaper article again. What is wrong with the soil on Harrison's farm?

## Listening

7 Listen to a conversation between two farmers. Mark the following statements as true (T) or false (F).

- Both farmers have acidic soil.
- Adding lime raises soil's salinity.
- The man's crops grow well in acidic soil.

8 Listen again and complete the conversation.

- Farmer 1: All this irrigated water is making my fields acidic. 1 \_\_\_\_\_  
\_\_\_\_\_?
- Farmer 2: Yeah, I have the same problem. I've heard of a few fixes, though.
- Farmer 1: Have 2 \_\_\_\_\_?
- Farmer 2: Only one so far. I've 3 \_\_\_\_\_  
\_\_\_\_\_ my fertilizer.
- Farmer 1: What are the results?
- Farmer 2: Well, 4 \_\_\_\_\_ the pH to 7.5.
- Farmer 1: That's good, right?
- Farmer 2: It is and it isn't. It works for now. 5 \_\_\_\_\_ time I irrigate, that'll change again. Do you see 6 \_\_\_\_\_?

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*This irrigated water is making my fields acidic.*

*I've heard of a few fixes.*

*What are the results?*

**Student A:** You are a farmer. Talk to Student B about:

- acidic soil
- treatment methods
- future plans

**Student B:** You are a farmer. Talk to Student A about soil acidity.

## Writing

9 Use the conversation from Task 8 to fill out the farmer's plan to lower soil acidity.

Problem: \_\_\_\_\_

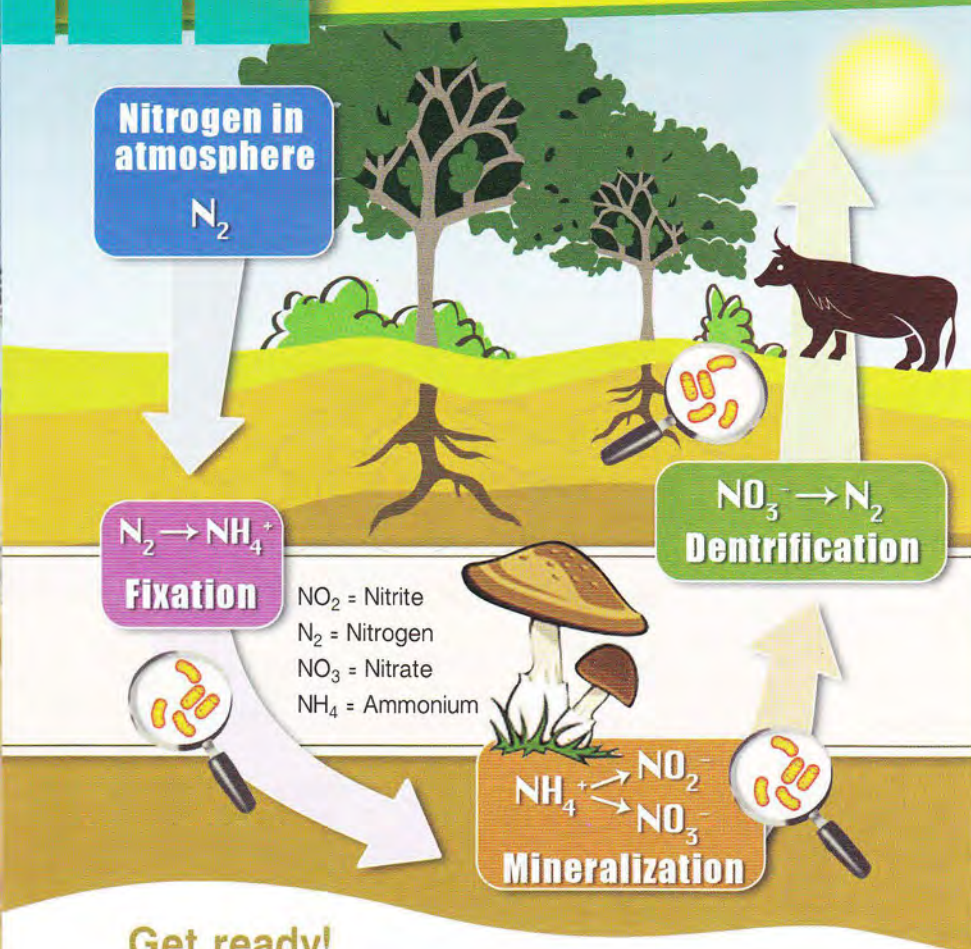
Possible Solution: \_\_\_\_\_

Pros: \_\_\_\_\_

Cons: \_\_\_\_\_

Plan for next year: \_\_\_\_\_





Nitrogen is a crucial nutrient for growing plants. Without the **nitrogen cycle**, which restores **nutrient-poor** soil, plants could not survive. During this cycle, nitrogen takes on many forms. It starts in the atmosphere as nitrogen gas. In this form, plants cannot absorb it. That changes after **fixation**, the next phase of the nitrogen cycle. During fixation, bacteria turn nitrogen into **ammonia**. In the next phase, mineralization, **decomposers** in the soil turn ammonia into **nitrites** and **nitrates**—forms of nitrogen that plants can use. Finally, during **dentrification**, bacteria reduce nitrates back into nitrogen gas.

Of course, the nitrogen cycle can also have negative effects. For example, it produces chemicals like **nitrous oxide**. When this substance leaks into bodies of water, **eutrophication** occurs. This build-up of algae can ruin a water supply. Unfortunately, commercial farming produces a great deal of such chemicals. A challenge facing modern farmers is to reduce their contribution to this harmful aspect of the nitrogen cycle.

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 How is nitrogen added to soil?
- 2 Why must farmers monitor nitrogen levels in soil?

### Reading

2 Read the textbook passage. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ Plants cannot survive without nitrogen.
- 2 \_\_\_ During fixation, decomposers turn ammonia into nitrogen.
- 3 \_\_\_ Nitrous oxide can cause algae build up in water supplies.

### Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

1 ammonia / nitrous oxide

- A \_\_\_\_\_ is a component in many fertilizers.  
 B \_\_\_\_\_ is a toxic product of the nitrogen cycle.

2 eutrophication / denitrification

- A \_\_\_\_\_ restores nitrogen in the air.  
 B \_\_\_\_\_ occurred in the pond due to fertilizer runoff.

4 Match the words (1-6) with the definitions (A-F).

- 1 \_\_\_ fixation
- 2 \_\_\_ decomposer
- 3 \_\_\_ nitrite
- 4 \_\_\_ nutrient-poor
- 5 \_\_\_ nitrate
- 6 \_\_\_ nitrogen cycle

- A not having the right amount of minerals to be healthy  
 B substance that bacteria create from ammonia  
 C the processes by which nitrogen is changed into chemical forms  
 D the process of converting nitrogen into ammonia  
 E substance that bacteria create from nitrites  
 F organism that turns dead animals or plants into chemical nutrients



6 Listen and read the textbook passage again. At what stage can plants start to absorb nitrogen gas?

## Listening

6 Listen to a conversation between two farmers. Choose the correct answers.

- Why are the farmers concerned about using fertilizer?
  - It might set back the current harvest.
  - It could affect the water supply.
  - It can reduce the nitrogen in the soil.
  - It may cause damage to the cover crop.
- What will the farmers do with the south field?
  - irrigate it more often
  - leave the field fallow next year
  - finishing harvesting its legumes
  - plant nitrogen restoring crops in it

7 Listen again and complete the conversation.

- Farmer 1: So, what should we do with the south field?
- Farmer 2: I'm not sure what you mean.
- Farmer 1: Well, this year's yield is pretty low. The soil might be nutrient poor.
- Farmer 2: What do you suggest?
- Farmer 1: We could plant legumes.
- Farmer 2: I'm not 1 \_\_\_\_\_.
- Farmer 1: Well, 2 \_\_\_\_\_ the soil is low on nitrogen. We could use legumes as this year's cover crop.
- Farmer 2: 3 \_\_\_\_\_, \_\_\_\_\_. Just have the legumes restore the nitrogen.
- Farmer 1: Exactly. It's better than using too much fertilizer. I don't want our 4 \_\_\_\_\_ getting damaged.
- Farmer 2: Well, I think that's a good idea. Let's 5 \_\_\_\_\_ this year's harvest. We still have a few days left.
- Farmer 1: Sounds good. Then we can sit down and 6 \_\_\_\_\_ what legumes to plant.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*What should we do with the south field?  
We could use legumes as the cover crop.  
It's better than using too much fertilizer.*

**Student A:** You are a farmer. Talk to Student B about:

- nitrogen in the fields
- fertilizer
- legumes

**Student B:** You are a farmer. Talk to Student A about nitrogen in the fields.

## Writing

9 Use the conversation from Task 8 to fill out the farmer's schedule.

# Harvest and Planting Schedule

South Field

- \_\_\_\_\_
- \_\_\_\_\_
- \_\_\_\_\_





## Get ready!

1 Before you read the passage, talk about these questions.

- 1 In what ways can soil be damaged?
- 2 What parts of your country have the best soil?


## A Guide to Soil Conservation

Without healthy soil, farmers can't produce healthy crops. But soil faces many threats, including **nutrient depletion** and **erosion**. Fortunately, several methods of **soil conservation** can turn unhealthy soil into a plant paradise.

One method, **crop rotation**, solves nutrient depletion. **Cover crops**, or **green manure**, are rotated with other crops. This process increases the amount of nitrogen in the soil and reverses **land degradation**.


In addition to addressing nutrient-depletion, farmers also combat erosion. Several practices can prevent erosion. Planting **windbreaks** stops topsoil loss from wind. **Perimeter runoff control** prevents erosion from water. For example, **grassways** slow water and direct it away from fields.

**Contour-farming** techniques, such as **keyline design**, also prevent water from eroding soil. In one method, farmers plow rows **perpendicular** to hills. The water slows as it reaches the rows, which results in less soil loss.




windbreak

erosion



cover crops



perpendicular

## Reading

2 Read the magazine article. Then, choose the correct answers.

- 1 What is the main purpose of the article?
  - A to show the benefits of soil additives
  - B to describe soil conservation methods
  - C to recommend soil conservation products
  - D to explain the financial costs of soil damage
- 2 Which is NOT a suggestion made in the article?
  - A planting cover crops
  - B using keyline design
  - C applying manure fertilizer
  - D having perimeter runoff control
- 3 Which would be the best solution for nutrient depletion?
 

A crop rotation	C windbreaks
B soil conservation	D contour farming

## Vocabulary

3 Match the words (1-8) with the definitions (A-H).

- 1 — nutrient depletion
  - 2 — contour farming
  - 3 — cover crops
  - 4 — green manure
  - 5 — soil conservation
  - 6 — grassways
  - 7 — keyline design
  - 8 — perimeter runoff control
- A a name for cover crops that add nitrogen
  - B process where nutrients are taken from soil
  - C grassy areas that slow water flow
  - D the practice of maintaining soil
  - E plants that add nutrients to soil and prevent it from washing away
  - F a method of plowing to prevent erosion
  - G the use of plants near a field's borders to prevent erosion
  - H design that maximizes water resources



**4 Write a word that is similar in meaning to the underlined part.**

- The rows are at right angles to the fence.  
p \_ \_ p e \_ d \_ \_ \_ \_ a \_
- The farmer needs a way to stop wind or water removing the soil in his fields. \_ \_ o \_ \_ \_ n
- Tree barriers shelter fields from the wind.  
\_ \_ n \_ \_ \_ \_ a \_ \_
- Growing different crops at different times helps keep soil healthy.  
c \_ \_ \_ r \_ \_ \_ t \_ \_ \_
- The forest experienced negative effects on the land after the flood.  
\_ \_ n \_ \_ e \_ \_ \_ d \_ \_ \_ \_ n

**5 Listen and read the magazine article again. What is the importance of perimeter grassways? What do they do?**

**Listening**

**6 Listen to a conversation between two farmers. Mark the following statements as true (T) or false (F).**

- The farmers are concerned about nutrient depletion.
- The land the farm sits on is flat.
- The farmers will plant a grassway.

**7 Listen again and complete the conversation.**

Farmer 1: I'm really worried about the soil in the fields. It's  
1 \_\_\_\_\_ soggy.

Farmer 2: Yeah, there's been so much rainfall the 2 \_\_\_\_\_.

Farmer 1: The soil is 3 \_\_\_\_\_. We have to do something.

Farmer 2: I agree. But what can we do?

Farmer 1: I think contour farming is a good option.

Farmer 2: I'm 4 \_\_\_\_\_ that. We'd have to re-design our fields.

Farmer 1: True, but look at our land! We have 5 \_\_\_\_\_.

Farmer 2: Well, you 6 \_\_\_\_\_ there. Contour-farming could be good for us in the next few years. But we have to do something sooner than that.

Farmer 1: How about starting with a grassway?

Farmer 1: I like that. We can buy some sod and install it next weekend.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*I'm worried about the soil in the fields.*  
*We have to do something.*  
*We'd have to re-design our fields.*

**Student A:** You are a farmer.

Talk to Student B about:

- soil condition
- future plans
- immediate plans

**Student B:** You are a farmer.

Talk to Student A about soil.

**Writing**

**9 Use the conversation from Task 8 and the magazine article to fill out the farmer's plan.**

**Plan for Field 7**

Problem: \_\_\_\_\_

Solution: \_\_\_\_\_

Problem: \_\_\_\_\_

Solution: \_\_\_\_\_

Problem: \_\_\_\_\_

Solution: \_\_\_\_\_



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How are fields in your country prepared for planting?
- 2 What planting methods are the most common in your country?

## Reading

2 Read the section of The Farmer's Guide. Then, mark the following statements as true (T) or false (F).

- 1  Amendments add nutrients to soil.
- 2  Herbicides should be applied weeks after planting.
- 3  Broadcast seeding is effective with oats.

## Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |  |  |
|--|--|
| 1 <input type="checkbox"/> seeds per pound   | 4 <input type="checkbox"/> amendment             |
| 2 <input type="checkbox"/> broadcast seeding | 5 <input type="checkbox"/> seeds per square foot |
| 3 <input type="checkbox"/> plant density     |  |

- A a method of scattering seeds  
 B amount of seeds planted per square foot  
 C the number of seeds in a pound of seeds  
 D the number of plants in a certain area  
 E a substance added to improve soil



## The Farmer's Guide



## Chapter 1: Preparing, Seeding, and Planting

Although different crops demand different preparation, some practices apply to almost any crop. And what you do before planting is just as important as what you do after. Preparing the **topsoil** is always key. Test it in late summer to determine if **amendments** like lime, sulfur, or phosphorous are needed to adjust acidity. If the soil is nutrient-deficient, add fertilizer.

Likewise, most fields require treatment with an **herbicide**. Waiting two weeks to plant after using some herbicides is recommended.

Once the **soil temperature** is right, planting can begin. The **seeding rate** is determined by the ideal **seeds per pound** and **seeds per square foot**. Be sure to calculate the appropriate **plant density**. A miscalculation will result in low **emergence**.

The actual planting of seeds will vary by crop. **Broadcast seeding** may work for some seeds, while seed drills work better for small grains such as wheat or oats.



4 Fill in the blanks with the correct words and phrases from the word bank.

**Word BANK**

soil temperature    topsoil    seeding rate  
herbicide    emergence    fertilizer

- The farmer used \_\_\_\_\_ to improve the soil.
- The weeds died after Mary used \_\_\_\_\_.
- It is still too cold to plant the seeds; the \_\_\_\_\_ is 25 degrees.
- During droughts, the \_\_\_\_\_ can be blown away by strong winds.
- The farmer was pleased to have 90 percent \_\_\_\_\_ of the newly planted crops.
- This field's \_\_\_\_\_ is 10 pounds per acre.

5 Listen and read the section of The Farmer's Guide again. Which month would be best to test the topsoil?

**Listening**

6 Listen to a conversation between two farmers. Check (✓) the items the farmers plan to implement to increase production.

- increased plant density
- fewer seeds per square foot
- fertilizer
- planting more fields

7 Listen again and complete the conversation.

**Farmer 1:** Well, our production has been down. We didn't produce 1 \_\_\_\_\_ this year as we did last year.

**Farmer 2:** That's true. You think it's because we planted 2 \_\_\_\_\_ close together?

**Farmer 1:** Yes, exactly. I know we were trying to grow more wheat per field. But it's 3 \_\_\_\_\_ effect.

**Farmer 2:** So what do you suggest?

**Farmer 1:** We'll 4 \_\_\_\_\_ our seeding rate and plant fewer seeds per square foot.

**Farmer 2:** I guess that would work. But we can do more to increase production.

**Farmer 1:** What were 5 \_\_\_\_\_?

**Farmer 2:** Well, just the usual. Adding 6 \_\_\_\_\_, things like that.

**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*Our production has been down.  
What do you suggest?  
We can do more to increase production.*

**Student A:** You are a farmer. Talk to Student B about:

- crop production
- plant density
- improving soil

**Student B:** You are a farmer. Talk to Student A about your fields.

**Writing**

9 Use the conversation from Task 8 to fill out the farmer's email to the farm owner.

Dear Mr. Owens.

I want to change how we \_\_\_\_\_.

This year, \_\_\_\_\_.

I think this is due \_\_\_\_\_.

I recommend that we \_\_\_\_\_.

We can also \_\_\_\_\_.

Please let me know what you think of these changes.

Sincerely,

\_\_\_\_\_





## Vegetables

## SEEDS UNLIMITED

Poblano Pepper \$3.19/pack

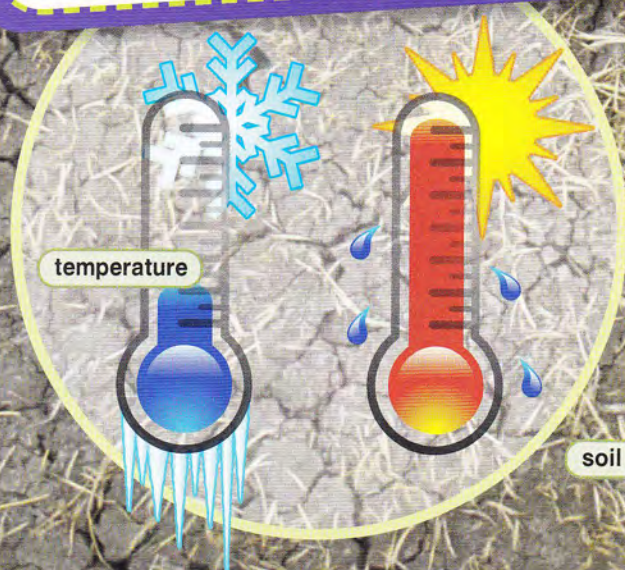
Plant in: full sun / soil temperature: 68-90 degrees Fahrenheit

Description: Poblanos are flavorful peppers that are perfect for spicing sauces. They grow in warm areas with moderate **humidity**. Check your **hardiness zone** to make sure Poblanos grow in your region. Plant seeds about twelve weeks before **last frost**. A local **long-range forecast** will help you determine when to plant. Poblanos need some water, but just to keep the soil slightly damp. Do not over-water. Harvest after 14 to 16 weeks.

Famosa Cabbage \$3.79/pack

Plant in: partial shade / soil temperature: 59-64.4 degrees Fahrenheit

Description: The Famosa Cabbage is a crispy vegetable that grows in cool **climates**. Famosas need lots of water, so areas with high **precipitation** are ideal for growing. Use plenty of **mulch** to maintain healthy **soil moisture**. These cabbages need only partial sun. Plant six weeks before last frost. Harvest in late autumn for best results.



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How does the climate in your country affect farming?
- 2 How can weather help and harm crops?

## Reading

2 Read the seed catalog. Then, mark the following statements as true (T) or false (F).

- 1  Poblano peppers grow best in areas with high precipitation.
- 2  Both types of seeds require full sun.
- 3  The cabbage should be harvested in the fall.

## Vocabulary

3 Fill in the blanks with the correct words and phrases from the word bank.

## Word BANK

precipitation last frost  
temperature hardiness zones

- 1 If the \_\_\_\_\_ falls too low, the plants will die.
- 2 Don't plant any seeds until after the \_\_\_\_\_.
- 3 If there is enough \_\_\_\_\_, you won't have to irrigate.
- 4 Different plants may have different \_\_\_\_\_.



**4 Match the words (1-5) with the definitions (A-E).**

- 1 \_\_\_ climate
- 2 \_\_\_ humidity
- 3 \_\_\_ mulch
- 4 \_\_\_ long-range forecast
- 5 \_\_\_ soil moisture

- A weather conditions in a particular area
- B the amount of water in the soil
- C the amount of water in the air
- D material that is spread on the ground to protect plants
- E a prediction of future weather conditions

**5 Listen and read the seed catalog again. What kind of location would be perfect for growing Famosa cabbage?**

**Listening**

**6 Listen to a conversation between a seed store employee and a customer. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ The Scottsdale seeds grow best in warm climates.
- 2 \_\_\_ The man suggests a different seed type.
- 3 \_\_\_ The last frost of the season has passed.

**7 Listen again and complete the conversation.**

**Customer:** Excuse me. Can you help me  
1 \_\_\_\_\_ some seeds?

**Employee:** 2 \_\_\_\_\_, \_\_\_\_\_. What type of crop do you want to grow?

**Customer:** I'm going to plant some lettuce. I found these Scottsdale lettuce seeds.

**Employee:** Oh, I wouldn't plant the Scottsdale. It needs a 3 \_\_\_\_\_ climate. I 4 \_\_\_\_\_ the Waldmann's lettuce.

**Customer:** 5 \_\_\_\_\_, \_\_\_\_\_? Why is that?

**Employee:** The Waldmann's is very hearty. It can 6 \_\_\_\_\_ weather around here.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*Can you help me pick out some seeds?  
I'm going to plant some ...  
I recommend the ...*

**Student A:** You work in a seed supply store. Talk to Student B about:

- type of crop
- seed types
- weather and climate

**Student B:** You want help choosing seeds. Answer Student A's questions.

**Writing**

**9 Use the conversation from Task 8 to fill out the customer feedback form.**

**Simon's Seed  
CUSTOMER FEEDBACK FORM**

Customer Name: \_\_\_\_\_

Items Purchased: \_\_\_\_\_

Was our employee helpful? Y / N

Please describe your experience: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# 14 Pricing



Dear Mr. Kowalski,

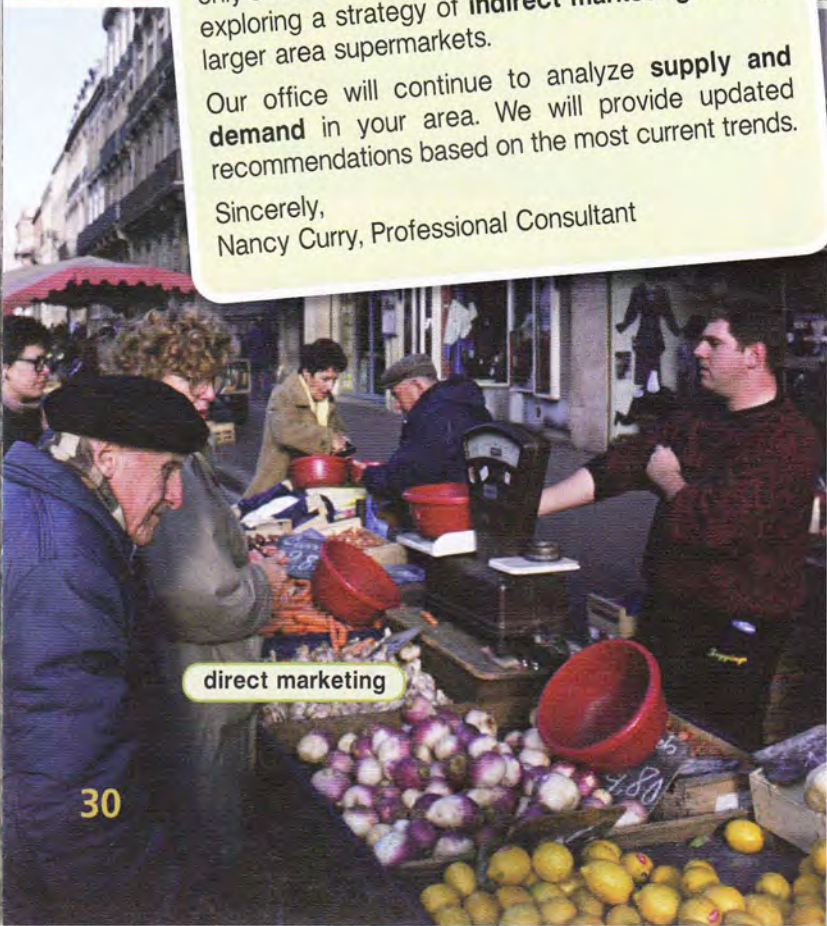
Our office analyzed your business practices as you requested. We have a few suggestions to improve your **pricing strategy**.

We believe that it is time to consider **pricing for competition**. There are several new **produce** sellers in your area. Some are offering lower prices for the same vegetables that you sell. For example, you sell spinach for \$5.49 per pound. Most other sellers are offering spinach for less than \$5.00 per pound. They attract customers who want large quantities by offering **pricing for value**. We suggest moderate price decreases that maintain **pricing for profit**. As long as your prices remain higher than your **cost of production**, your business will make money.

We also think it is time for you to expand beyond **direct marketing**. Profits will remain limited if you only sell at the local farmer's market. We recommend exploring a strategy of **indirect marketing** through larger area supermarkets.

Our office will continue to analyze **supply and demand** in your area. We will provide updated recommendations based on the most current trends.

Sincerely,  
Nancy Curry, Professional Consultant



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What factors influence crop prices?
- 2 What factors are included in a farmer's cost of production?

## Reading

2 Read the business letter. Then, choose the correct answers.

- 1 What is the purpose of the letter?  
A to market a new product  
B to offer new services to a client  
C to bill a customer for services  
D to explain the results of an analysis
- 2 How do the client's prices compare to others?  
A They are higher than other's prices.  
B They are the same as other's prices.  
C They are lower than other's prices.  
D They change more often than other's prices.
- 3 What suggestion does Ms. Curry make?  
A lowering production costs  
B studying local supply and demand  
C marketing to grocery stores in the area  
D increasing prices by five percent

## Vocabulary

3 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **direct marketing / indirect marketing**  
A In \_\_\_\_\_, customers buy from farmers.  
B \_\_\_\_\_ involves farmers selling crops to stores where customers shop.
- 2 **supply and demand / cost of production**  
A Prices must make up for the \_\_\_\_\_.  
B Prices change according to \_\_\_\_\_.
- 3 **pricing strategy / produce**  
A Sell this \_\_\_\_\_ before it spoils.  
B Change your \_\_\_\_\_ to make a bigger profit.



**5 Match the words (1-4) with the definitions (A-D).**

- 1 \_\_\_ pricing  
 2 \_\_\_ pricing for profit  
 3 \_\_\_ pricing for competition  
 4 \_\_\_ pricing for value
- A setting a price that is less than other sellers  
 B setting a lower price for large quantities  
 C the process of establishing costs for items  
 D setting a price that exceeds the cost of production

**6 Listen and read the business letters again. What does the consultant suggest would attract more clients?**

**Listening**

**6 Listen to a conversation between a consultant and a farmer. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ The man did not know his competition's prices.  
 2 \_\_\_ The woman suggests a new pricing strategy.  
 3 \_\_\_ The client will charge the same price for large and small amounts.

**7 Listen again and complete the conversation.**

**Consultant:** Mr. Kowalski, did you 1 \_\_\_\_\_ to read our recommended business improvements?

**Farmer:** I did, Miss Curry. Can you give me some more information about 2 \_\_\_\_\_?

**Consultant:** Of course. Your spinach goes for \$5.49 per pound. All 3 \_\_\_\_\_ in your area sell spinach for at least \$0.50 less per pound.

**Farmer:** Wow. I didn't 3 \_\_\_\_\_ my products are. What changes do you suggest?

**Consultant:** We 5 \_\_\_\_\_ some estimates. You can lower your spinach price to \$4.89 per pound and still cover your 6 \_\_\_\_\_.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*Can you give me more information about ...  
 I didn't realize how expensive ...  
 What changes do you suggest?*

**Student A:** You are a business consultant. Talk to Student B about:

- client's prices
- competition's prices
- new pricing strategy

**Student B:** You are a farmer. Talk to Student A about the price of your crops.

**Writing**

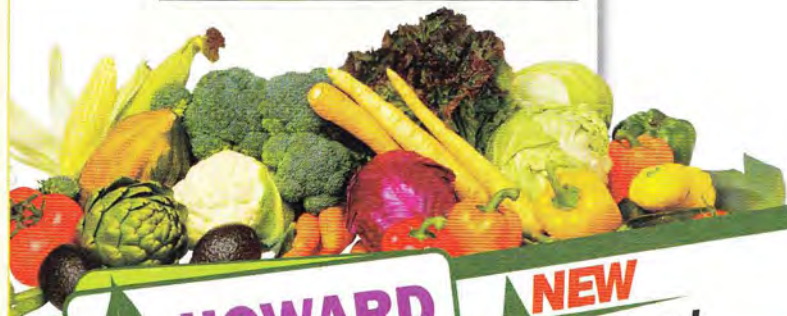
**9 Use the conversation from Task 8 to describe the new pricing strategy.**

Beginning this week, orders of \_\_\_\_\_

\_\_\_\_\_

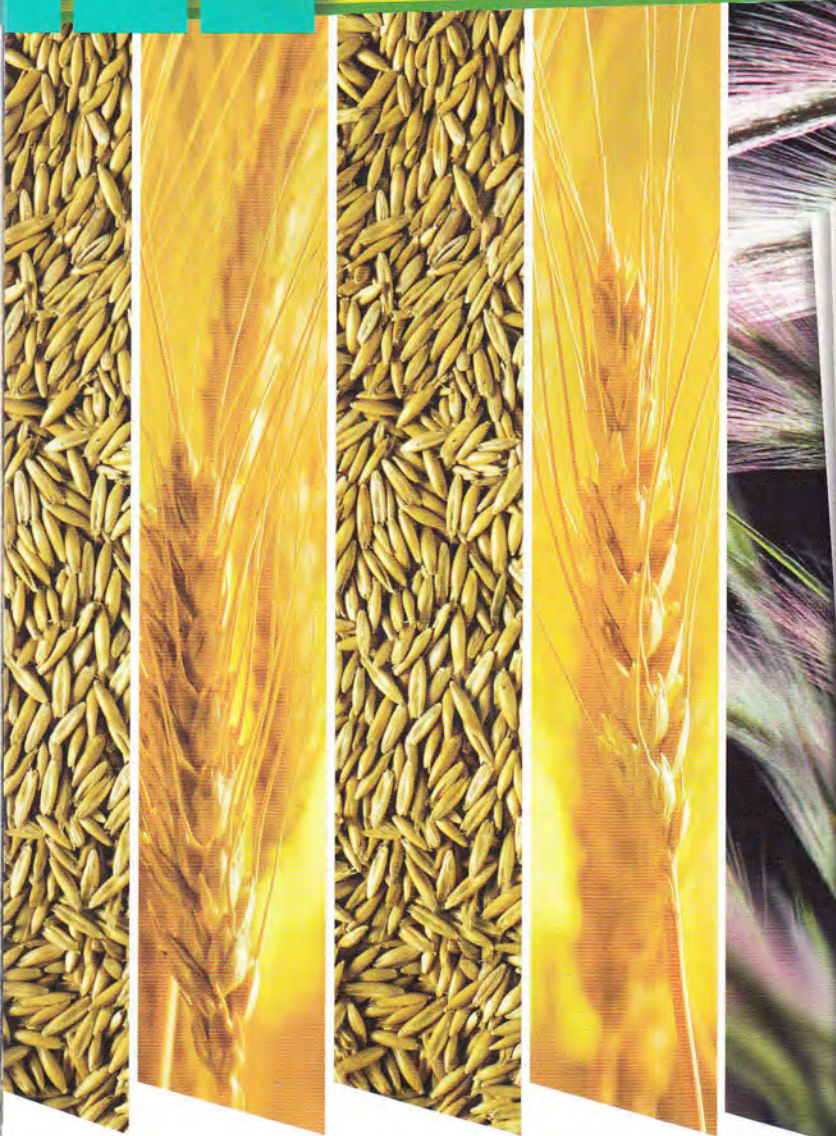
Orders of \_\_\_\_\_

will still be \_\_\_\_\_



**NEW**  
**Low Prices!**





## GOVERNMENT PROMISES HELP FOR WHEAT GROWERS

Government officials introduced a plan this week to enhance wheat production. Spokesperson Harriet Greene responded to reporters' questions on Friday. She said the government is committed to improving economic conditions in wheat-growing regions.

Greene said the plan supports the small farmers that the world's **food and fiber industry** relies on. The plan does have critics. But Greene responded that improving the wheat industry improves economies everywhere. She stated that the industry's **decline** negatively affects people around the world.

The plan is to decrease supply by employing a strategy of adjusting production. Leaving some wheat fields **fallow** should prevent excessive **surpluses** and wasted resources. Hopefully, this will increase **market demand**. Additionally, the government will implement various forms of **price support**. This includes establishing **price floors**, raising **quotas** and reducing **tariffs** on exports. Finally, the government is setting up a department to address **foreign trade enhancement**. The department will identify ways to increase wheat trade worldwide.

### Get ready!

1 Before you read the passage, talk about these questions.

- 1 Does your government take an active role in agriculture?
- 2 Do you think governments should control agriculture? Why or why not?

### Reading

2 Read the newspaper article. Then, mark the following statements as true (T) or false (F).

- 1  Some people do not support the plan
- 2  The plan calls for planting all available wheat fields.
- 3  The government intends to lower taxes on exported wheat.

### Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |  |  |
|--|--|
| 1 <input type="checkbox"/> decline     | 4 <input type="checkbox"/> market demand             |
| 2 <input type="checkbox"/> quota       | 5 <input type="checkbox"/> adjusting production      |
| 3 <input type="checkbox"/> price floor | 6 <input type="checkbox"/> foreign trade enhancement |

- A the desirability of a product
- B the process of becoming less or worse
- C a limit on the amount of something
- D a legal limit on how low a price can be
- E the act of improving international trade
- F changing the amount of a product that is made



**4** Write a word that is similar in meaning to the underlined part.

- Most agriculture focuses on the production of food and other products.  
f \_ \_ \_ \_ n \_ \_ i b \_ \_ i n \_ \_ \_ \_ \_
- Taxes on imports and exports can help trade. t \_ r \_ \_ \_ \_
- Leave that field unplanted this season. \_ \_ l l \_ \_
- The extra supply of wheat lowered prices. \_ u \_ p \_ \_ \_
- Methods of maintaining high prices ensures that crop prices don't collapse. \_ \_ \_ c e \_ \_ p p \_ \_ \_

**5** Listen and read the newspaper article again. How does the government plan to decrease supply?

**Listening**

**6** Listen to a conversation between farmer and assistant. Choose the correct answers.

- Why isn't the farmer planting wheat?
  - The fields need to lie fallow for a season.
  - The price for wheat seeds has increased.
  - He is participating in a government program.
  - He is worried he won't be able to sell it.
- Why are the prices for wheat low?
  - The wheat crop was not good.
  - There is a surplus of wheat.
  - The market price for wheat is high.
  - The production of wheat has decreased.

**7** Listen again and complete the conversation.

**Assistant:** But won't we lose money if we 1 \_\_\_\_\_ enough?

**Farmer:** Actually, the government is paying us to 2 \_\_\_\_\_.

**Assistant:** I had 3 \_\_\_\_\_. Why are they doing that?

**Farmer:** They want to decrease the supply. See, right now there's a 4 \_\_\_\_\_. So prices are low. But if everyone produces less wheat, the supply will fall. Do you see what I mean?

**Assistant:** I think so. And if the supply falls, the 5 \_\_\_\_\_ too. Right?

**Farmer:** Exactly. 6 \_\_\_\_\_, we'll just plant some cover crops in field 4-B.

**Speaking**

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*But won't we lose money.  
Why are they doing that?  
If everyone produces less wheat,  
the supply will fall.*

**Student A:** You are a farming assistant. Ask Student B about:

- not planting wheat
- government intervention
- supply and prices

**Student B:** You are a farmer. Answer Student A's questions.

**Writing**

**9** Use the conversation from Task 8 to fill out the memo to farm staff. Explain why wheat will not be planted. Include information about surpluses and prices.

**Franklin Farms**

**Memo**

Staff: This year \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Jack Franklin  
Owner, Franklin Farms



# Glossary

- accelerated lambing** [N-UNCOUNT-U5] **Accelerated lambing** is the act of breeding ewes more than once per year.
- acidity** [N-UNCOUNT-U9] **Acidity** is the concentration of acid in soil.
- adjusting production** [N-UNCOUNT-U15] **Adjusting production** is the process of limiting the production of a product to only what is needed for immediate sales.
- alkaline** [ADJ-U9] If a soil is **alkaline**, it contains an alkali and has a pH value greater than 7.0.
- amendment** [N-COUNT-U12] An **amendment** is a substance added to soil to improve it.
- ammonia** [N-UNCOUNT-U10] **Ammonia** is a chemical made from Nitrogen and Hydrogen, created during fixation.
- antibiotics** [N-COUNT-U1] **Antibiotics** are drugs that are used to kill harmful bacteria.
- apiary** [N-COUNT-U7] An **apiary** is a place where bees are kept.
- beef** [N-UNCOUNT-U1] **Beef** is the name for the meat derived from cattle.
- beehive frame** [N-COUNT-U7] A **beehive frame** is a structure that is constructed to house a bee colony.
- beesuit** [N-COUNT-U7] A **beesuit** is a protective garment that is worn by beekeepers.
- bridling** [N-UNCOUNT-U6] **Bridling** is the act of training a horse to accept a bit in its mouth.
- broadcast seeding** [N-UNCOUNT-U12] **Broadcast seeding** is a way of scattering seeds evenly over a large area of land by hand or mechanically, often followed by raking to cover the seeds.
- broiler** [N-COUNT-U3] A **broiler** is a medium-sized chicken sold in the US that is larger than a fryer but smaller than a roaster.
- broodmare** [N-COUNT-U6] A **broodmare** is a female horse that is used for breeding.
- calf** [N-COUNT-U4] A **calf** is a baby cow.
- cattle** [N-COUNT-U1] **Cattle** are the cows and bulls raised on a farm or ranch for beef or milk.
- chick** [N-COUNT-U3] A **chick** is a baby chicken.
- classification** [N-UNCOUNT-U8] **Classification** is the process of sorting things into different groups.
- clay** [N-UNCOUNT-U8] **Clay** is a type of sticky soil used to make pots, bricks, or tiles.
- climate** [N-COUNT-U13] A **climate** is set of weather conditions that is usual in a particular area.
- coarse-grained** [ADJ-U8] If soil is **coarse-grained**, it consists of relatively large particles.
- cold smoke aerosol** [N-COUNT-U7] A **cold smoke aerosol** is a pressurized container filled with a smoky substance that pacifies bees.
- colony** [N-COUNT-U7] A **colony** is an area where a group of bees live.
- composition** [N-UNCOUNT-U8] **Composition** is the parts that make something what it is.
- confinement lamb production** [N-UNCOUNT-U5] **Confinement lamb production** is a method of raising sheep in which the sheep are kept indoors.
- contour farming** [N-UNCOUNT-U11] **Contour farming** is when farmers plough rows perpendicular to the slope of a hill so that water does not as easily erode soil.
- cost of production** [N-UNCOUNT-U14] **Cost of production** is the sum of all costs required to produce something, including labor, land and materials.
- cover crops** [N-COUNT-U11] **Cover crops** are plants that farmers plant to increase the nutrients in the soil and to prevent soil from washing away.



- crop rotation** [N-UNCOUNT-U11] **Crop rotation** is the process by which farmers grow different crops at different times to replenish the soil.
- dairy** [N-UNCOUNT-U4] **Dairy** is a classification of food that includes all items made from milk.
- decline** [N-UNCOUNT-U15] **Decline** is the process of becoming less or worse.
- decomposer** [N-COUNT-U10] A **decomposer** is an organism or process that turns dead organic matter into chemical nutrients.
- dentrification** [N-UNCOUNT-U10] **Dentrification** is the process by which nitrogen is removed or lost from nitrogen compounds like nitrates and nitrites.
- direct marketing** [N-UNCOUNT-U14] **Direct marketing** is a method of sales in which the producer sells products directly to consumers.
- distribute** [V-T-U5] To **distribute** something is to sell it.
- dynamic space** [N-COUNT-U2] A **dynamic space** is the amount of space required to contain a sow's body in an enclosure and allow her to move.
- emergence** [N-UNCOUNT-U12] **Emergence** is the percentage of seeds that sprout into seedlings.
- erosion** [N-UNCOUNT-U11] **Erosion** occurs when wind or water removes the soil from a particular area and leaves it somewhere else.
- eutrophication** [N-UNCOUNT-U10] **Eutrophication** is the process by which substances like nitrates permeate fresh bodies of water.
- ewe** [N-COUNT-U5] A **ewe** is a female sheep.
- fallow** [ADJ-U15] If a field is **fallow**, it does not have crops planted in it.
- farrow-to-finish farm** [N-COUNT-U2] A **farrow-to-finish farm** is a farm that breeds and raises pigs from birth until they reach market weight.
- farrow-to-nursery farm** [N-COUNT-U2] A **farrow-to-nursery farm** is a farm that breeds and raises pigs that are then transferred to finishing farms to reach market weight.
- feed conversion efficiency** [N-NONCOUNT-U1] **Feed conversion efficiency** is a measure of how efficiently an animal converts feed into body mass.
- feed ration** [N-COUNT/NONCOUNT-U1] A **feed ration** is a selected amount of food that is enough for an animal's daily needs.
- feeder lamb** [N-COUNT-U5] A **feeder lamb** is a lamb that is sold for finishing.
- feedlot** [N-COUNT-U1] A **feedlot** is a large enclosed area for feeding a large number of cattle before processing.
- fertilizer** [N-UNCOUNT-U12] Any substance added to soil that improves its fertility is called a **fertilizer**.
- fine-grained** [ADJ-U8] If a soil is **fine-grained**, it consists of relatively tiny particles.
- finishing** [N-UNCOUNT-U5] **Finishing** is the act of feeding livestock and preparing it for slaughtering.
- fixation** [N-UNCOUNT-U10] During **fixation**, nitrogen in the air is converted into ammonia.
- flock** [N-COUNT-U5] A **flock** is a large group of sheep.
- foal** [N-COUNT-U6] A **foal** is a horse that is younger than one year.
- food and fiber industry** [N-COUNT-U15] The **food and fiber industry** is a network of farmers, distributors, retailers and other organizations that contribute to the production of food and other products.



# Glossary

- foreign trade enhancement** [N-COUNT-U15] **Foreign trade enhancement** is the practice of improving systems and technologies for trade with other countries.
- free-range** [N-UNCOUNT-U3] If a chicken is **free-range**, it is able to roam around outside.
- grade** [N-COUNT-U1] The **grade** of beef is a measure of its quality.
- grain** [N-COUNT-U8] A **grain** is a very small, hard piece of material.
- grass-fed** [ADJ-U1] If cattle are **grass-fed**, they primarily eat grass foraged from a pasture or fields.
- grassway** [N-COUNT-U11] A **grassway** is one form of perimeter runoff control that appears between rows of crops.
- green manure** [N-UNCOUNT-U11] **Green manure** is a name for cover crops that farmers plant when they want to add Nitrogen to the soil.
- growth hormone** [N-COUNT-U1] A **growth hormone** is a chemical that increases cattle's rate of growth or milk production.
- halter breaking** [N-UNCOUNT-U6] **Halter breaking** is the act of training a horse to be led by a halter that is placed on its head.
- hardiness zone** [N-COUNT-U13] A **hardiness zone** is a defined geographical area with a climate that supports a particular set of plant life.
- hatchery** [N-COUNT-U3] A **hatchery** is a place that provides artificial conditions for hatching eggs.
- heifer** [N-COUNT-U4] A **heifer** is a young cow that has not yet given birth to a calf.
- hen** [N-COUNT-U3] A **hen** is an adult female chicken.
- herbicide** [N-UNCOUNT-U12] **Herbicides** are substances used to kill plants or slow down their growth.
- herd** [N-COUNT-U1] A **herd** is a group of cattle.
- highly-organic** [ADJ-U8] If a soil is **highly-organic**, it largely consists of organic material as opposed to non-organic mineral material.
- hog** [N-COUNT-U2] A **hog** is a pig that has grown large enough to be eaten.
- Holstein** [N-COUNT-U4] A **Holstein** is a breed of cattle that dairy farmers use.
- homogenize** [V-T-U4] To **homogenize** is to mix milk so that the cream is completely blended into it.
- honey** [N-UNCOUNT-U7] **Honey** is a sweet substance that is made by bees.
- honeycomb** [N-COUNT-U7] A **honeycomb** is a structure of six-sided cells that is constructed by bees within their hives.
- humidity** [N-UNCOUNT-U13] **Humidity** is the amount or measurement of moisture in the air.
- indirect marketing** [N-UNCOUNT-U14] **Indirect marketing** is a method of sales in which the producer sells products to a retailer or other party who then sells to consumers.
- intensive farming** [N-UNCOUNT-U3] **Intensive farming** is a method of raising chickens in a climate-controlled enclosed area.
- keyline design** [N-COUNT-U11] **Keyline design** is used to maximize the water resources for one piece of land.
- lambing period** [N-COUNT-U5] A **lambing period** is the time during which ewes produce lambs.
- land degradation** [N-UNCOUNT-U11] **Land degradation** occurs when human interaction with the land causes negative effects, like floods and fires.
- last frost** [N-UNCOUNT-U13] **Last frost** is the last time during the year that the temperature gets low enough to kill plants in a particular region. It usually indicates the beginning of the growing season.



- layer** (as in bird raised to lay eggs) [N-COUNT-U3] A **layer** is a hen that is used to produce eggs.
- lime** [N-UNCOUNT-U9] **Lime** is a white, alkaline substance used in farming that is made by crushing shells or limestone.
- liquid smoke** [N-UNCOUNT-U7] **Liquid smoke** is a substance made from mixing smoke with water. It is used to pacify bees.
- litter** [N-COUNT-U2] A **litter** is a group of baby pigs born together.
- litter** [N-UNCOUNT-U3] **Litter** is the manure and wood shaving waste produced by a chicken.
- long-range forecast** [N-UNCOUNT-U13] A **long-range forecast** is a prediction of weather conditions more than ten days in advance.
- mare** [N-COUNT-U6] A **mare** is a female horse.
- market** [N-COUNT-U14] A **market** is a place or area where products are advertised and sold.
- market demand** [N-UNCOUNT-U15] **Market demand** is the total demand for a particular product in a particular area or market.
- market slaughter lamb** [N-COUNT-U5] A **market slaughter** lamb is a lamb that is sold to be slaughtered.
- market weight** [N-NONCOUNT-U1] **Market weight** is how much cattle should weigh before they are processed into beef.
- milk pipeline** [N-COUNT-U4] A **milk pipeline** is system at a dairy that transfers milk from a cow into cooling and storage containers.
- milking herd** [N-COUNT-U4] A **milking herd** is a group of cows that produce milk.
- milking parlor** [N-COUNT-U4] A **milking parlor** is a special area in a dairy where cows are milked.
- mineralization** [N-UNCOUNT-U10] **Mineralization** is the process where nitrogen from organic matter is converted into ammonium.
- mulch** [N-UNCOUNT-U13] **Mulch** is a material that is spread over the ground to protect plants and stop unwanted plants from growing.
- nitrates** [N-COUNT-U10] **Nitrates** are chemical compounds that bacteria create from nitrites.
- nitrites** [N-COUNT-U10] **Nitrites** are chemical compounds that bacteria create from ammonium.
- nitrogen cycle** [N-COUNT-U10] The **Nitrogen cycle** is the set of processes by which nitrogen is changed into chemical forms and travels through various mediums, including soil, water, and air.
- nitrous oxide** [N-UNCOUNT-U10] **Nitrous oxide** is a product of denitrification, and its levels have risen significantly with the increased use of fertilizers.
- nutrient depletion** [N-UNCOUNT-U11] **Nutrient depletion** is the process where nutrients are taken out of the soil by plants or animals.
- nutrient-poor** [ADJ-U10] If soil is **nutrient-poor**, it does not have the right amount of minerals and other nutrients to produce healthy crops.
- pasteurize** [V-T-U4] To **pasteurize** is to use a special process of heating milk to kill bacteria.
- peat** [N-UNCOUNT-U8] **Peat** is a material made from decaying plants that can be added to soil to help plants grow.
- perimeter runoff control** [N-UNCOUNT-U11] **Perimeter** runoff control is the use of things like plants to prevent water from eroding the soil.
- perpendicular** [ADJ-U11] If a line is **perpendicular**, it forms a right angle to a line or plane.
- pH value** [N-COUNT-U9] The **pH value** is a measure between 0 and 14 that indicates the acidity (pH < 7.0) or alkalinity (pH >7.0) of a substance.



# Glossary

- plant density** [N-COUNT-U12] **Plant density** is the number of plants in a certain area.
- poultry** [N-COUNT/UNCOUNT-U3] **Poultry** are birds raised on farm for eggs and/or meat.
- precipitation** [N-UNCOUNT-U13] **Precipitation** is rain, snow and other forms of water that fall from the sky.
- preventative disease control** [N-PHRASE-U6] **Preventative disease control** is a regimen of activities that are performed to avoid disease.
- price floor** [N-COUNT-U15] A **price floor** is a legal limit on how low the price of a product can be.
- price support** [N-UNCOUNT-U15] **Price support** is a method of maintaining a high price for a product.
- pricing** [N-UNCOUNT-U14] **Pricing** is the process of establishing a cost for something.
- pricing for competition** [N-UNCOUNT-U14] **Pricing for competition** is the process of establishing a product's price based on prices that other sellers are using.
- pricing for profit** [N-UNCOUNT-U14] **Pricing for profit** is the process of establishing a product's price that will cover and exceed the cost of production.
- pricing for value** [N-UNCOUNT-U14] **Pricing for value** is the process of establishing a product's price that offers lower prices for larger quantities.
- pricing strategy** [N-COUNT-U14] A **pricing strategy** is the method a seller chooses for establishing a product's price.
- primary breeder** [N-COUNT-U3] A **primary breeder** is a person who breeds chickens used by others for egg production.
- primary salinity** [N-UNCOUNT-U9] **Primary salinity** is when salts get into the soil by natural processes, such as groundwater movement.
- processing facility** [N-COUNT-U1] A **processing facility** is a place where cattle are killed and butchered.
- produce** [N-UNCOUNT-U14] **Produce** is fresh, raw food like fruits and vegetables.
- pullet** [N-COUNT-U3] A **pullet** is a young hen under one year of age.
- quota** [N-COUNT-U15] A **quota** is a limit on the amount or number of a product that can be imported or exported.
- rBST** [N-UNCOUNT-U4] **Recombinant bovine somatotropin (rBST)** is an artificial growth hormone given to cows to increase milk production.
- roaster** [N-COUNT-U3] A **roaster** is the largest size of chicken sold in the US.
- rooster** [N-COUNT-U3] A **rooster** is an adult male chicken.
- sacking out** [N-UNCOUNT-U6] **Sacking out** is the act of training a horse to not fear objects that humans place on it, particularly blankets or sacks.
- saddling** [N-UNCOUNT-U6] **Saddling** is the act of training a horse to accept having a saddle placed on its back.
- salinity** [N-UNCOUNT-U9] **Salinity** is the concentration of salt in soil.
- sand** [N-UNCOUNT-U8] **Sand** is a type of soil made of very small pieces of rocks or minerals that is often found on the beach or in the desert.
- seasonal market** [N-COUNT-U5] A **seasonal market** is a periodic increase in demand for livestock.
- secondary salinity** [N-UNCOUNT-U9] **Secondary salinity** is when salts get into the soil from human activities such as from irrigation.
- seeding rate** [N-COUNT-U12] **Seeding rate** is the amount of seeds planted per hectare.
- seeds per pound** [N-COUNT-U12] **Seeds per pound** is a measure of the number individual seeds in a pound of seeds.



**seeds per square foot** [N-COUNT-U12] **Seeds per square foot** is the amount of seeds planted in a square foot of space.

**silt** [N-UNCOUNT-U8] **Silt** is made when soil mixes with a body of water and then is deposited.

**skep** [N-COUNT-U7] A **skep** is a traditional beehive made from grass or straw.

**smoker** [N-COUNT-U7] A **smoker** is a device that produces smoke for the purpose of pacifying bees.

**social space** [N-UNCOUNT-U2] **Social space** is the amount of space required to allow a sow in an enclosure to socially interact with other sows.

**sodicity** [N-UNCOUNT-U9] **Sodicity** is the concentration of sodium in soil.

**sodium** [N-UNCOUNT-U9] **Sodium** is a chemical element with the symbol Na that is an ingredient in table salt.

**soil conservation** [N-UNCOUNT-U11] **Soil Conservation** is the act of maintaining soil so that it does not erode.

**soil moisture** [N-UNCOUNT-U13] **Soil moisture** is the amount of water contained in a particular region's soil.

**soil temperature** [N-UNCOUNT-U12] The **temperature** of the **soil** is called soil temperature.

**sow** [N-COUNT-U2] A **sow** is a female pig.

**sow farm** [N-COUNT-U2] A **sow farm** is a farm that raises female pigs for the purpose of producing baby pigs or piglets.

**stall** [N-COUNT-U6] A **stall** is a small partition inside a barn for an animal to live in.

**stallion** [N-COUNT-U6] A **stallion** is a male horse.

**static space** [N-UNCOUNT-U2] **Static space** is the amount of space required to contain a sow's body in an enclosure.

**sulfur** [N-UNCOUNT-U9] **Sulfur** is a chemical element with the symbol S that is typically yellow in color and has a powerful smell.

**supply and demand** [N-UNCOUNT-U14] **Supply and demand** is the relationship between the amount of a product that can be produced and the amount that consumers can or will buy.

**surplus** [N-COUNT-U15] A **surplus** is an amount or quantity of a product that exceeds the demand for that product.

**swine** [N-COUNT-U2] A **swine** is a type of animal including pigs and related animals.

**tariff** [N-COUNT-U15] A **tariff** is a tax on products that are being imported to or exported from a country.

**temperature** [N-COUNT-U13] **Temperature** is the measurement of something's heat.

**texture** [N-COUNT-U8] **Texture** is how something feels when touched.

**top-bar hive** [N-COUNT-U7] A **top-bar hive** is a beehive that has a suspended bar from which bees hang their honeycomb.

**topsoil** [N-UNCOUNT-U12] **Topsoil** is the top most layer of soil in which plants anchor most of their roots and from which they absorb most of their nutrients.

**toxic** [ADJ-U9] If something is **toxic**, it is harmful to life.

**udder** [N-COUNT-U4] An **udder** is the part of a cow that hangs from her belly and produces milk.

**Unified Soil Classification System (USCS)** [N-UNCOUNT-U8] The **Unified Soil Classification System** is a tool for grouping soils into types based on their texture and composition.

**vaccination schedule** [N-COUNT-U6] A **vaccination schedule** is a planned administration of disease-preventing injections.

**veil** [N-COUNT-U7] A **veil** is a protective covering for the head and face that is worn by beekeepers.

**windbreaks** [N-COUNT-U11] **Windbreaks** are tree barriers planted in a way that prevent the soil from eroding.



**CAREER  
PATHS**

# Agriculture

Book  
**3**

Neil O' Sullivan  
James D. Libbin



**Express Publishing**



## Scope and sequence

Unit	Topic	Reading context	Vocabulary	Function
1	Animal behavior	Job Posting	conditioning, handling, temperament, restraint, flight zone, squeeze chute, chute score, flighty, body length, crowd pen, point of balance, animal welfare	Asking about experience
2	Animal health	Magazine Article	veterinarian, diagnose, monitor, infectious, parasite, lice, tick, insecticide, deworm, respiration, lethargy, antibiotics, vaccination	Describing conditions
3	Animals and grain	Newspaper Article	feed grains, food grains, livestock, manure, land use, feedstuff-to-foodstuff, inefficient, inedible, consumption, roughage	Correcting a misconception
4	Bioengineering	Seminar Schedule	biotechnology, cloning, gene, gene enhancement, genetic engineering, transgenic, expression, regulation, prohibition, societal concerns	Changing topics
5	Cropping systems	Industry Publication	diversify, cropping system, conventional tillage, conservation tillage, crop residue, zero tillage, crop rotation, fallow, polyculture, winter wheat, spring wheat, burn-down herbicide	Describing a plan
6	Growing seasons	Magazine Article	growing season, growing degree day, base temperature, mean temperature, last frost date, elevation, photoperiod, greenhouse, hoop house, freeze protection, site selection, heaters	Making suggestions
7	Weeds, pests, and disease	Farmer's Guide	bacterial, fungal, pathogen, blight, fungicide, sanitize, pest management, suppression, biological control, pesticide, weed, herbicide, weed map, mulching	Disagreeing with an opinion
8	Diagnosing crop problems	Webpage	agricultural advisor, symptom, symptom pattern, field pattern, wilt, brown, stippled, stunted, biotic, abiotic, symptomology key	Explaining steps
9	Agribusiness management	Business Letter	net farm income, farm cash receipts, income, gross farm revenue, feed costs, interest payments, fixed cash expense, noncash expense, total production expenses, debt, loan	Pointing out an error
10	International trade	Trade Profiles	international trade, export, import, export dependent, import dependent, balance of trade, trade deficit, trade surplus, tariff, quota, World Trade Organization	Agreeing to do something
11	The futures market	Article	futures market, commodity, value, change, open, high, low, index, stocks-to-use ratio, ending stock, carryover, beginning stock	Talking about possibilities
12	Sustainable farming	Flyer	sustainable, systems perspective, non-renewable resource, soil amendment, compost, monoculture, biodiversity, intercropping, economic sustainability, off-farm impact	Asking for advice
13	Technological advances	Product Listing	technology, mechanized, auto-steer, GPS, automated bin management, self-propelled, air seeding, drip irrigation system, smart irrigation control, overwatering, overplanting	Expressing doubt
14	Organic farming	Industry Publication	compliance, organic, certifier, inspector, organic systems plan, material inputs, organic integrity, contamination, commingle, field activity log, audit trail documents	Asking for more information
15	GMOs	Products Webpage	genetically modified organism, conventional seed, biotech seed, trait, nitrogen efficiency, yield enhancement, herbicide-tolerant, insect-resistant, drought-tolerant, characterizing, analysis, animal performance assessment	Talking about future events



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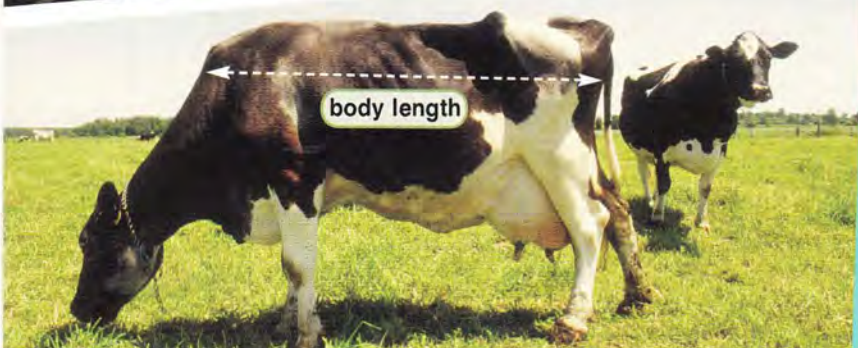
# 1 Animal behavior



crowd pen



restraint



body length

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can you tell if an animal is safe to approach?
- 2 What are the average flight zones of different animals?

## Reading

2 Read the job posting. Then, mark the following statements as true (T) or false (F).

- 1  The lead handler always uses restraints when working with cattle.
- 2  The health and well-being of the cattle is recorded by the lead handler.
- 3  Applicants should have knowledge of different conditioning methods.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                      |  |
|--------------------------------------|--|
| 1 <input type="checkbox"/> handling  | 4 <input type="checkbox"/> squeeze chute |
| 2 <input type="checkbox"/> restraint | 5 <input type="checkbox"/> chute score   |
| 3 <input type="checkbox"/> crowd pen | 6 <input type="checkbox"/> flighty       |

- A a rating of how well an animal tolerates being forced through a chute  
 B a device that restricts movement  
 C prone to running away  
 D herding and caring for animals  
 E a fenced area used to gather and herd animals  
 F a narrow fenced passage

## Wanted: Lead Handler

Open Season Ranch is looking for a responsible and experienced cattle handler to join our team. Competitive applicants should have excellent references and at least three years of experience.

**Herding** - Open Season's Lead Handler will ensure proper herding techniques in our **crowd pens**, **squeeze chutes**, and other facilities. Since we work with several breeds, each with a different **temperament**, it is important that the Lead Handler be highly skilled in dealing with **flighty** animals. Restraints are used as needed, but exceptional **handling** skills are always preferable.

**Maintenance** - In addition to herding, the Lead Handler will also be responsible for collecting and recording data that is relevant to our beef cattle operation. This includes determining key characteristics of each herd such as average **body length** and **chute score**. The Lead Handler will direct our team of handlers in **conditioning** methods, such as regular walks among the herd or any other appropriate techniques. The lead Handler will instruct staff on managing animal **flight zones** and **points of balance**.

**Animal Welfare** - The Lead Handler will also be responsible for ensuring the health and well-being of our herds. This includes working with our veterinarian and any internal or external **animal welfare** personnel.

4 Write a word that is similar in meaning to the underlined part.

- 1 Each animal has a different level of emotional stability.    \_ e \_ \_ e \_ \_ \_ e \_ \_
- 2 Altering the behavior and temperament of cattle requires patience.  
c \_ n \_ \_ \_ \_ \_ n \_ \_ \_
- 3 The spot that determines which way animals will move in relation to a herder is usually around the shoulder.  
\_ o i \_ \_    \_ \_ b \_ \_ a \_ \_ e
- 4 Wild animals have a large area in which a human's presence will cause an animal to move away.    \_ \_ \_ g h \_    \_ \_ n e
- 5 The health and well-being of animals is a major concern for every rancher.  
\_ n \_ \_ a \_    \_ e \_ \_ a \_ \_
- 6 Philip is measuring the span from head to rear of all the livestock.  
b \_ \_ \_    \_ e n \_ \_ \_



- 5 Listen and read the job posting again. Why must the Lead Handler be skilled at handling breeds with different temperaments?

## Listening

- 6 Listen to a conversation between an interviewer and a job applicant. Check (✓) the items the prospective employee has experience of.

- 1  working with cattle
- 2  managing employees
- 3  conditioning cattle
- 4  training new employees

- 7 Listen again and complete the conversation.

**Interviewer:** So how much experience do you have?

**Applicant:** I 1 \_\_\_\_\_ ranch for about three years.

**Interviewer:** Did you work with cattle there?

**Applicant:** Yes, I worked with both pigs and cattle.

**Interviewer:** So, how would you deal with flighty animals?

**Applicant:** Well, 2 \_\_\_\_\_ if you get too close to them. I would try to stay near the edges of their flight zone.

**Interviewer:** Good. Do you have any experience with conditioning?

**Applicant:** Yes. I used to walk through the herds at least once a day so they'd get used to me.

**Interviewer:** Okay, so the last thing I want to ask you about is 3 \_\_\_\_\_.

**Applicant:** I've 4 \_\_\_\_\_ a management position.

**Interviewer:** Have you ever 5 \_\_\_\_\_?

**Applicant:** Oh, yes, definitely. I used to train all the 6 \_\_\_\_\_.

**Interviewer:** Well, that's most of what being a lead handler is about.

**Applicant:** Okay. I think I 7 \_\_\_\_\_.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*How much experience do you have?*

*How would you deal with flighty animals?*

*Do you have any experience with ...*

**Student A:** You are a rancher. Interview Student B about:

- experience with animals
- conditioning
- experience in management

**Student B:** You are in an interview. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the job posting to write a lead handler's resume. Include: experience, skills, and responsibilities.

# Resume

Name: \_\_\_\_\_

Experience: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Skills: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Responsibilities: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

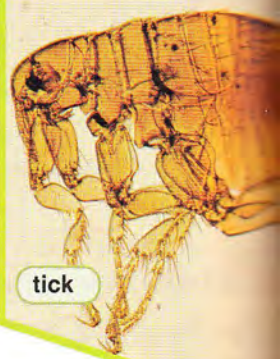




lice



tick



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some common health problems livestock get?
- 2 How can farmers prevent the spread of disease in livestock?

## Reading

2 Read the magazine article. Then, choose the correct answers.

- 1 What is the article mainly about?
  - A choosing the right veterinarian for livestock
  - B identifying parasitic infections in livestock
  - C preventing infectious diseases in livestock
  - D diagnosing livestock illnesses at home
- 2 According to the article, what can prevent parasitic infections?
  - A having veterinarians check animals regularly
  - B cleaning areas frequented by livestock
  - C washing the coats of livestock
  - D feeding livestock a healthy diet
- 3 What is used to treat respiratory infections?
 

A antibiotics	C vaccinations
B dietary supplements	D isolation

## Disease Control Modern Farmer Mar. Ed.

Proper health management involves much more than treating occasional infections. In fact, preventative care is probably the most important thing you can do to ensure the health of your livestock. While only a licensed **veterinarian** can **diagnose** your animals, there are plenty of ways that you can **monitor** your livestock for **infectious** diseases and prevent their spread.

Some of the most common health problems among livestock are the results of **parasites**. Common parasitic organisms include worms, **lice**, and **ticks**. You can help prevent the spread of these parasites by regularly cleaning your facilities. You may also consider treating the coats of your livestock with **insecticides**. If you suspect a parasitic infection among your livestock, seek professional help immediately. Your veterinarian may be able to treat your animals with drugs, dietary remedies, and **deworming** techniques.

Another major concern is respiratory disease. Although there are numerous causes, the symptoms of respiratory infections are always the same. If you notice labored **respiration**, fever, and **lethargy** among your livestock, contact your veterinarian right away. Respiratory infections can be deadly if ignored, but they can usually be treated effectively with **antibiotics**. More importantly, many types of infections can be prevented with **vaccinations**.

p.47

vaccination

## Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |                  |                 |
|------------------|-----------------|
| 1 ___ lice       | 4 ___ deworming |
| 2 ___ tick       | 5 ___ lethargy  |
| 3 ___ infectious |                 |

- A a parasitic arachnid
- B the act of killing or removing worms
- C a state of extreme exhaustion
- D a parasitic insect
- E easily spread



4 Read the sentence pair. Choose where the words best fit the blanks.

1 veterinarian / parasite

A A \_\_\_\_\_ infected several cows.

B The \_\_\_\_\_ gave the horse a shot.

2 respiration / antibiotics

A Check for labored \_\_\_\_\_.

B Use \_\_\_\_\_ to kill the infection.

3 diagnose / monitor

A Handlers should \_\_\_\_\_ their herds for health problems.

B Only a medical professional can \_\_\_\_\_ diseases.

4 vaccination / insecticide

A Use a(n) \_\_\_\_\_ to kill the lice.

B A(n) \_\_\_\_\_ can boost animals' immunity.

5 Listen and read the magazine article again. How can a veterinarian treat your animals if they have parasites?

## Listening

6 Listen to a conversation between a farmer and a veterinarian. Check (✓) the items the veterinarian suggests doing to the sick cattle.

- 1  isolating the infected animals
- 2  taking them to the vet's office
- 3  giving the animals antibiotics
- 4  cleaning the facilities

7 Listen again and complete the conversation.

Farmer: 1 \_\_\_\_\_, doc?

Veterinarian: 2 \_\_\_\_\_. When did you first noticed these symptoms?

Farmer: Well, last week a few of them 4 \_\_\_\_\_ some trouble breathing.

Veterinarian: Was there anything else?

Farmer: Yes, they seemed, well, really tired. Basically, they 4 \_\_\_\_\_ to want to move.

Veterinarian: Those symptoms, lethargy and difficulty breathing, are 5 \_\_\_\_\_ a respiratory infection.

Farmer: So, what can we do? Can you treat them?

Veterinarian: Well, fortunately, I think they'll recover if we treat them with 6 \_\_\_\_\_. You need to keep this herd away from your other livestock. We don't want this spreading.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*When did you notice these symptoms?*

*What can we do?*

*You need to ...*

**Student A:** You are a veterinarian. Interview Student B about:

- cattle's symptoms
- a diagnosis
- treatment

**Student B:** You are a farmer. Answer Student A's questions about your cattle.

## Writing

9 Use the conversation from Task 8 to write a treatment plan. Include: animal symptoms, the diagnosis, and how they will be treated.

### Treatment Plan

Symptoms: \_\_\_\_\_

Diagnosis: \_\_\_\_\_

Treatment: \_\_\_\_\_



livestock



feed grain



food grain



roughage



Plains Herald - Nebraska's oldest daily newspaper  
est. 1858



## Who should get the grain?

OMAHA - Carl Prinz wakes up at 4 am daily to feed to his **livestock**. Each year, Prinz's cattle eat 12 tons of **feed grains** and hay. For the most part, this is corn and barley he grows. He also occasionally feeds them **roughage** which is **inedible** to humans.

Mary Baker lives ten miles down the road from Prinz. She refuses to eat meat. She says that the **feed-to-food** agricultural process is highly **inefficient** and environmentally destructive. It is much better, she argues, to adopt a vegetarian diet.

US farms produce 189 billion tons of grain a year, with most being used for animal feed. Just a portion is grown for human **consumption**, and much of that is exported. This means that the majority of our agricultural land is used to produce meat.

It is a **land use** policy choice that has several negative consequences. Animals produce vast quantities of **manure** that pollute the environment if improperly disposed of. And feeding grain to animals means that fewer **food grains** are exported. On the other hand, the economic and dietary benefits of livestock cannot and should not be ignored.

### Get ready!

- Before you read the passage, talk about these questions.
  - Do farmers in your country grow grain mainly for people or animals?
  - Do you think that animals should eat less grain? Why or why not?

### Reading

- Read the newspaper article. Then, mark the following statements as true (T) or false (F).
  - Mr. Prinz's cattle eat 12 tons of roughage each year.
  - Most grain is grown for animals to eat.
  - Animal grain consumption affects the export of grain.

### Vocabulary

- Match the words (1-6) with the definitions (A-F).

- |                    |                   |
|--------------------|-------------------|
| 1 ___ food grain   | 4 ___ consumption |
| 2 ___ manure       | 5 ___ roughage    |
| 3 ___ feed-to-food | 6 ___ inefficient |

- the act of eating
- the process of feeding grain to animals that will be used for meat
- tough plant matter
- waste from livestock
- crops that are grown for human food
- wasteful



**4** Write a word that is similar in meaning to the underlined part.

- Plants that are unable to be eaten by humans can feed animals. i \_ \_ \_ i \_ \_ \_
- Raising animals intended for food or other products is difficult, but profitable. l \_ \_ \_ \_ \_ o \_ \_
- There are numerous concerns over the current state of human transformation of land. \_ a \_ \_ \_ \_ e
- Grain intended for livestock is much more plentiful than food grain. \_ e \_ d g \_ \_ \_ \_

**5** Listen and read the newspaper article again. What are the negative effects of using the majority of farm lands to raise animals?

**Listening**

**6** Listen to a conversation between a reporter and a farmer. Choose the correct answers.

- Why does the farmer grow corn?
  - A to feed pigs
  - B to sell to people
  - C to make corn syrup
  - D to manufacture fuel
- How does the farmer defend growing corn?
  - A The corn is inedible for people to eat.
  - B People can not eat the corn.
  - C People eat the pigs that ate his corn.
  - D Starving people get some of the corn.

**7** Listen again and complete the conversation.

**Reporter:** Mr. Tepper, Is it true that livestock today 1 \_\_\_\_\_ that could be feeding starving people?

**Farmer:** That's just not true.

**Reporter:** Can you elaborate on that?

**Farmer:** Well, take 2 \_\_\_\_\_. We grow corn for local pig producers.

**Reporter:** But couldn't you feed that corn directly to people?

**Farmer:** I wouldn't 3 \_\_\_\_\_.

**Reporter:** You mean to say your 4 \_\_\_\_\_ to humans?

**Farmer:** No, it's just people 5 \_\_\_\_\_ eat it. They tend to prefer sweet corn. And I don't grow that. I 6 \_\_\_\_\_.

**Speaking**

**8** With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*Is it true that livestock eat grain that could feed ...*  
*That's just not true.*  
*Can you elaborate on that?*

**Student A:** You are reporter. Ask Student B questions:

- animals and grain
- your crops
- feed-to-food

**Student B:** You are farmer. Answer student A's questions.

**Writing**

**9** Use the conversation from Task 8 and the newspaper article to write an article about animals, grain, and food. Include the types of crops animals eat and the feed-to-food process.



**Animals, grain and food**

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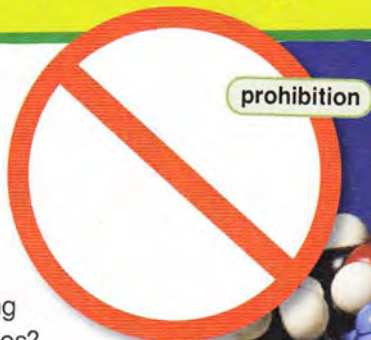
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## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can bioengineering improve animal industries?
- 2 What are some concerns about bioengineering?



prohibition

genes

biotechnology

## Animal Bioengineering

National Association of Bioengineers  
(NAB) Westphalia University

### Friday March 18

4:30 pm Registration • Parker Hall lobby

5:30 pm Keynote Address

Chapman Ballroom. Keynote speaker Dr. Mary Gilbertson will describe her research in **genetic engineering**.

### Saturday March 19

8:30 am – 12:00 pm Presentations, Parker Hall

Group A: Room 119

**Transgenic organisms.** Dr. Meyers White talks about current research and newly developed transgenic organisms and their benefits.

Group B: Room 106

**Biotechnology applications in agriculture.** Dr. Francis Gray discusses three promising new directions for biotechnology in agriculture.

2:00 pm – 4:00 pm Poster Session

Rorschach Exhibition Area

### Sunday March 18

8:30 am – 12:00 pm Presentations, Parker Hall

Group A: Room 119

**Cloning bacteria and other microorganisms:** engineering applications. Dr. Ursula Prsybysic and Dr. William Shawcross present on the latest engineering applications.

Group B: Room 106

**Genes, gene expression, and gene enhancement:** new techniques for producing favorable outcomes. Dr. Samel Perez discusses a set of techniques developed by Camber University.

2:00 pm – 3:00 pm Closing Remarks

Chapman Ballroom. Dr. Whitaker will discuss **societal concerns** about bioengineering. How might we face greater **regulation** of our research and even **prohibition**?



cloning

## Reading

2 Read the conference schedule. Then, mark the following statements as true (T) or false (F).

- 1  The keynote speaker will address biotechnology in agriculture.
- 2  On Sunday, group B attends a presentation on cloning bacteria.
- 3  The closing remarks will discuss concerns with bioengineering.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                       |  |
|---------------------------------------|--|
| 1 <input type="checkbox"/> cloning    | 4 <input type="checkbox"/> prohibition         |
| 2 <input type="checkbox"/> gene       | 5 <input type="checkbox"/> expression          |
| 3 <input type="checkbox"/> transgenic | 6 <input type="checkbox"/> genetic engineering |

- A the appearance of a trait  
 B making a copy of an organism  
 C a segment of DNA  
 D banning something  
 E altering genetic material  
 F having artificially introduced genetic material

4 Read the sentence pair. Choose where the words best fit the blanks.

### 1 gene enhancement / regulation

- A \_\_\_\_\_ can create stronger animals.  
 B There is strict \_\_\_\_\_ of genetic research.

### 2 biotechnology / societal concerns

- A There are many \_\_\_\_\_ about cloning.  
 B Robert wants to work in the \_\_\_\_\_ field.



- 5 🎧 Listen and read the conference schedule again. What is Dr. Meyers White going to talk about?

## Listening

- 6 🎧 Listen to a conversation between an interviewer and a speaker. Choose the correct answers.

- 1 What is the interview mostly about?  
 A the benefits of bioengineering in agriculture  
 B the government's support of biotechnology  
 C the health risks of bioengineered foods  
 D the impact of consumer's concerns
- 2 What does the speaker suggest as a solution?  
 A opposing government regulations  
 B communicating better with consumers  
 C publishing the latest scientific discoveries  
 D testing transgenic products more often

- 7 🎧 Listen again and complete the conversation.

**Interviewer:** So, what are the challenges of agricultural bioengineering?

**Speaker:** Well consumers fear that genetically modified 1 \_\_\_\_\_.

**Interviewer:** Shouldn't people be worried about eating genetically modified food?

**Speaker:** Not at all. 2 \_\_\_\_\_ genetically modified food is safe to eat. We just need to do a better job of communicating this with the public.

**Interviewer:** What do you think will happen if you don't 3 \_\_\_\_\_ about genetically modified foods?

**Speaker:** 4 \_\_\_\_\_ consumers have been very vocal. Governments there have responded by 5 \_\_\_\_\_ of agriculture. In some cases, they have responded by prohibiting all genetically modified products. This is not what we want to happen.

**Interviewer:** 6 \_\_\_\_\_!

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*What are the challenges of bioengineering ...  
 Consumers fear that ...  
 Some governments have ...*

**Student A:** You are a reporter. Interview student B. Talk about:

- challenges
- consumer opinion
- government response

**Student B:** You are a speaker at a conference, answer student A's questions.

## Writing

- 9 Use the conversation from Task 8 to write notes about the challenges of bioengineering. Include the challenges and consequences.

### Bioengineering

Challenges: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Consequences: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_







conventional tillage

burn-down herbicide

crop residue

polyculture

winter wheat

## Diversification

### Overview -

Farmers benefit from understanding diversification. This section outlines benefits of **diversifying** and some ways to do it.

**Why diversify?** - Diversifying a **crop system** offers farmers economic and environmental benefits.

Many farmers use **conventional tillage** because they think it is cheaper. That is not always true in the long term.

**Conservation tillage** methods that rely on diversification can be more expensive at first. However, they protect the long-term health of the soil.

There are environmental benefits as well. Diversified fields are healthier. Farmers often find they use fewer fertilizers and **burn-down herbicides** after they diversify.

**How to diversify** - We suggest you start by contacting your local agricultural extension office. They can help you make informed decisions about which crops are most suitable.

Next, you need to research the market for those crops. Determine which crops are economical.

Finally, consider if you want to use **crop rotation** or **polyculture**. With the former, farmers often leave a section of their fields **fallow**. If they also use **zero tillage** methods, they will leave **crop residues** in place. Unfortunately, fallow fields mean less available cropland at a given time. On the other hand, many popular crops, such as **winter wheat** and **spring wheat**, are not suitable for polyculture. So making this decision requires careful thought.

## Get ready!

1 Before you read the passage, talk about these questions.

- How can conventional tilling damage soil?
- What are some types of cropping systems? What are their strengths and weaknesses?

## Reading

2 Read the publication on cropping systems. Then, choose the correct answers.

- What is the passage mostly about?
  - the price of conventional tillage
  - the environmental effects of fertilizer
  - the diversification of crop systems
  - the market price for various crops
- Which is NOT advice given in the passage?
  - research the market for crops
  - select a method of crop diversification
  - contact the agricultural extension office
  - use herbicides after diversification
- What is the drawback to a fallow field?
  - It results in less available land for crops.
  - It has herbicide residues that harm crops.
  - It becomes less suitable for polyculture.
  - It must be fertilized before planting again.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                    |                            |
|--------------------|----------------------------|
| 1 ___ fallow       | 4 ___ conventional tillage |
| 2 ___ zero tillage | 5 ___ crop residue         |
| 3 ___ polyculture  | 6 ___ spring wheat         |

- parts of plants left in the field after harvest
- growing different plants in the same field
- having no crops
- the standard cropping system
- a crop that is harvested in summer or fall
- a technique for growing crops without tilling



**4 Write a word that is similar in meaning to the underlined part.**

- 1 A practice that prevents water and soil loss protects fields.  
\_o \_ \_ \_ \_ \_ t \_ \_ n t \_ \_ \_ \_ e
- 2 Wheat that is planted in the fall is harvested in the spring.  
w \_ \_ \_ \_ \_ w \_ \_ \_ \_ \_
- 3 Use the weedkiller before planting.  
\_ \_ \_ n-d \_ \_ \_ \_ e \_ \_ \_ \_ \_ e
- 4 The process of growing different crops one after the other on a field improves soil quality. c \_ \_ \_ r \_ \_ \_ \_ \_ n
- 5 There are several methods of growing crops.  
\_ \_ \_ p s \_ s \_ \_ \_ s
- 6 Increase the variety of your crops to reduce fertilizer use.  
d \_ \_ \_ r \_ \_ \_ \_

**5 Listen to the publication on cropping systems again. What is a negative effect of crop rotation?**

**Listening**

**6 Listen to a conversation between a farmer and an assistant. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ Rotating crops will require less fertilizer.
- 2 \_\_\_ They plan to plant crops in all five fields.
- 3 \_\_\_ Planting peanuts will deplete the soil.

**7 Listen again and complete the conversation.**

**Farmer:** We're going to 1 \_\_\_\_\_ our crops in the spring.

**Assistant:** Why do you want to do that?

**Farmer:** Well, it'll allow us to 2 \_\_\_\_\_ more and to use less 3 \_\_\_\_\_.

**Assistant:** So, 4 \_\_\_\_\_ do we do this?

**Farmer:** First, we 5 \_\_\_\_\_ five separate sections. One each for wheat, corn, soybeans, and peanuts.

**Assistant:** Peanuts?

**Farmer:** Wheat takes 6 \_\_\_\_\_ the soil. Once we plant a crop of peanuts in that field, the nitrates will be replenished. So we can grow wheat there again.

**Assistant:** Now you said five sections, but there are only four crops.

**Farmer:** That's because the fifth section will be left fallow. 7 \_\_\_\_\_.

**Assistant:** Let me guess, that helps the soil replenish too.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*We're going to start ... in the spring.*

*Wheat depletes the soil.*

*The fifth section will be fallow.*

**Student A:** You are a farmer. Talk to Student B about:

- crop rotation
- wheat and peanuts
- fallow fields

**Student B:** You are a farmer's assistant. Talk to Student A about next year's cropping system.

**Writing**

**9 Use the conversation from Task 8 and the publication and dialogue to write a schedule for next year's cropping system. Include: the type of system, crops, and field.**

**Crops schedule**

System: \_\_\_\_\_

\_\_\_\_\_

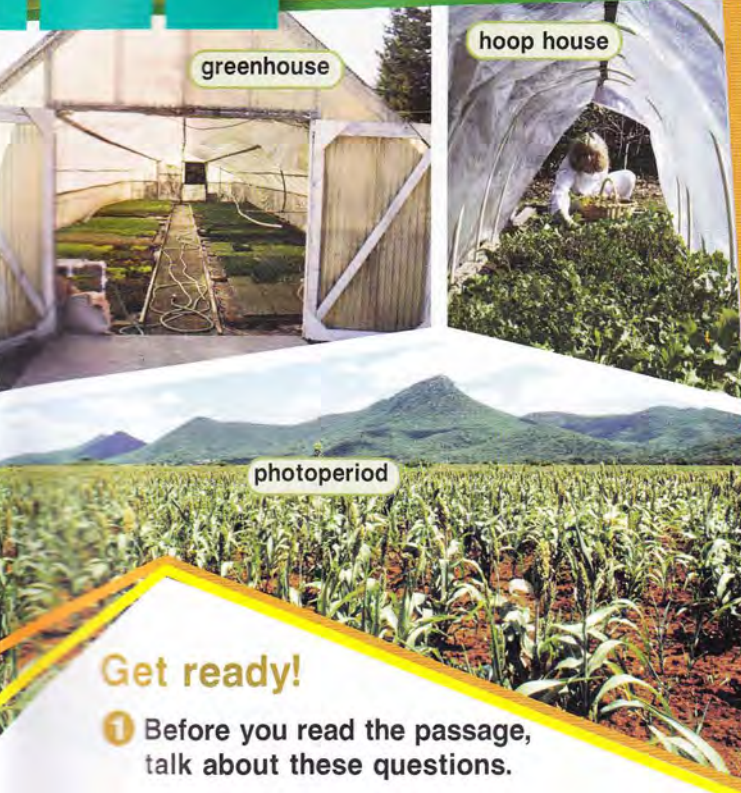
Crops: \_\_\_\_\_

\_\_\_\_\_

Fields: \_\_\_\_\_

\_\_\_\_\_





### Get ready!

1 Before you read the passage, talk about these questions.

- How long are the growing seasons in your country?
- How can farmers extend growing seasons?

### Reading

2 Read the magazine article. Then, mark the following statements as true (T) or false (F).

- The author believes site selection is the most important aspect of planting crops.
- Areas with short photoperiods have colder temperatures.
- Hoop houses increase air temperature.

### Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |   |   |
|---|---|
| 1 <input type="checkbox"/> base temperature | 4 <input type="checkbox"/> site selection     |
| 2 <input type="checkbox"/> last frost date  | 5 <input type="checkbox"/> mean temperature   |
| 3 <input type="checkbox"/> greenhouse       | 6 <input type="checkbox"/> growing degree day |
- A the act of choosing a place to plant crops  
 B the last day during which plants may freeze  
 C the minimum temperature at which plants may grow  
 D a structure that retains solar energy  
 E the average temperature in an area  
 F a measure of how much heat a plant will receive in a day

Aggie Trends Magazine • Summer Edition

## The Challenges of Growing Seasons

One of the most critical concerns for any agriculturist is the changing of seasons. Specifically, the decline in temperature, often sharp and precipitous, that occurs as each fall turns to winter. Plants have varying degrees of tolerance for cold, so different strategies for coping with the cold may be used with each type of crop. Next to the characteristics of the plants themselves, the most important issue to consider is **site selection**.

Each agricultural site has its own unique characteristics. Different sites have differing growing seasons based on **elevation**, **growing degree days**, and **last frost dates**. For example, one site may have very high growing degree days, while in another area, the **mean temperature** may barely rise over the **base temperature**. Agriculturists can protect their crops from the cold by selecting sites with long **photoperiods** and higher mean temperatures.

Of course, selecting a new site isn't always an option. After all, humans have cultivated crops in nearly every region on Earth. Less favorable sites may require special care. For example, there are several methods of **freeze protection** that an agriculturist can use. **Greenhouses** and **hoop houses** can be used to absorb and trap whatever heat the region does receive. Additionally, **heaters** can be used to raise the temperature of the air around tree crops.

4 Write a word that is similar in meaning to the underlined part.

- Long amounts of time that plants are exposed to light produce strong plants.  
p \_ \_ \_ \_ p \_ \_ \_ \_ s
- The structure with a curved roof that traps heat allows farmers to grow in cold seasons.  
\_ o \_ \_ \_ o \_ \_ \_
- Janet's farm is at a higher height of an area relative to the ocean level.  
\_ l \_ \_ \_ \_ \_ n
- Preventing crops from freezing saved the harvest last winter.  
\_ r e \_ \_ \_ p \_ \_ \_ \_ t \_ \_ \_
- Norman wants to start a farm in an area with a long period during which plants grow.  
g \_ \_ \_ \_ \_ g \_ e \_ \_ \_ \_
- Get a device that burns fuel to create heat to keep the plants from freezing.  
\_ \_ a \_ \_ \_



5 Listen and read the magazine article again. What do heaters do?

## Listening

6 Listen to a conversation between two farmers. Choose the correct answers.

- 1 What does the man want to do?
- A reduce fuel costs
  - B extend the growing season
  - C construct a second hoop house
  - D purchase less expensive heaters
- 2 When does the man suggest they use heaters?
- A in the fall
  - B in the winter
  - C in the spring
  - D in the summer

7 Listen again and complete the conversation.

- Farmer 1:** I want to try to extend our growing season.
- Farmer 2:** How would we do that?
- Farmer 1:** Well, we could plant our tomatoes, radishes, and spinach a month or two early if we used a hoop house.
- Farmer 2:** Perhaps. It would be nice to plant early.
- Farmer 1:** I'm trying to figure how we could extend our season into the late fall.
- Farmer 2:** Well, what about heaters?
- Farmer 1:** Oh, I see. When it starts to 1 \_\_\_\_\_ in the fall, we could use heaters at night.
- Farmer 2:** Exactly. We could probably have 2 \_\_\_\_\_ in a year.
- Farmer 1:** Hmm ... We could plant early, before the 3 \_\_\_\_\_. Then we could plant again in the late summer after harvest.
- Farmer 2:** Right. The only problem is size. The hoop house can't hold that many plants.
- Farmer 1:** That's a 4 \_\_\_\_\_.
- Farmer 2:** Let's 5 \_\_\_\_\_ the spinach and 6 \_\_\_\_\_.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

USE LANGUAGE SUCH AS:

*I want to try to ...*

*It would be nice to plant early.*

*We could use the heaters at night.*

**Student A:** You are a farmer. Talk to Student B about:

- longer growing seasons
- hoop houses
- heaters

**Student B:** You are a farmer. Talk to Student B about growing seasons.

## Writing

9 Use the conversation from Task 8 to write a letter to a farm owner. Include: how to extend the growing season, equipment needed, and the benefits.

Dear \_\_\_\_\_

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Regards

\_\_\_\_\_



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 Name a damaging weed, pest, and disease in your country?
- 2 What are some ways to avoid crop damage from weeds, pests, and disease?



pesticide



fungal

biological control

## Reading

2 Read the page from the farmer's guide. Then, mark the following statements as true (T) or false (F).

- 1  The guide advises against applying herbicides directly to fields.
- 2  Biological controls pose fewer safety risks than chemical controls.
- 3  Fungal diseases are easier to prevent than bacterial diseases.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                                      |  |
|--------------------------------------|--|
| 1 <input type="checkbox"/> sanitize  | 4 <input type="checkbox"/> pathogen        |
| 2 <input type="checkbox"/> fungal    | 5 <input type="checkbox"/> weed            |
| 3 <input type="checkbox"/> bacterial | 6 <input type="checkbox"/> pest management |

- A preventing organisms from harming crops  
 B being or related to fungus  
 C an unwanted wild plant  
 D being or related to bacteria  
 E to kill bacteria  
 F an organism that causes disease

## Semple's Guide to Farming

Three of the greatest threats to farmers are weeds, pests, and diseases. Nevertheless, an informed farmer can develop effective strategies for dealing with these problems.

Weeds,  
Pests,  
and  
Disease

## Weeds

Weeds grow everywhere, but they seem to prefer farmer's fields. Use a **weed map** to identify problem areas. Then apply **herbicides** as needed for **suppression**. If **mulching** weeds, it is not advised to apply mulch directly to your fields.

## Pests

Pests, primarily insects but also small mammals and birds, destroy countless crops every year. This is why farmers need a sound **pest management** strategy. These can be chemical or biological. Chemical controls refer to **pesticides**. They tend to be very effective but carry safety risks. Less risky, though sometimes less effective, are **biological controls**. An example is the predatory ground beetle, which feeds on crop-eating ground worms.

## Disease

Disease arrives from one of three types of **pathogens**: **bacterial**, **viral**, and **fungal**. The first two are rather difficult to fight. The best defense is maintaining good soil and growing conditions to keep plants strong. Prevent fungal diseases with **fungicides**. Finally, simply **sanitizing** equipment can sometimes prevent the spread of **blight**.

4 Read the sentence pair. Choose where the words best fit the blanks.

1 weed maps / biological controls

A \_\_\_\_\_ show where to apply herbicides.

B \_\_\_\_\_ give farmers an alternative to pesticides.

2 herbicide / blight

A The \_\_\_\_\_ destroyed the entire crop.

B Most weeds can be controlled with \_\_\_\_\_.

3 fungicide / suppression

A Wendy used a \_\_\_\_\_ to protect her crops.

B \_\_\_\_\_ of pests is a concern for farmers.

4 mulching / pesticide

A \_\_\_\_\_ plant waste can enrich soil.

B \_\_\_\_\_ effectively controls insects.



- 5 Listen and read the page from the farmer's guide again. What does it suggest is the best defence against diseases?

## Listening

- 6 Listen to a conversation between two farmers. Choose the correct answers.

- 1 What did the man use on his crop?  
 A Biological controls  
 B Insects  
 C Chemical pesticides  
 D Herbicides
- 2 Which biological control will the man use?  
 A other plants    C wasps  
 B borers    D bollworms

- 7 Listen again and complete the conversation.

**Farmer 1:** I just discovered that I have corn borers in my cornfields. I have to do something before they ruin my crop.

**Farmer 2:** I had a similar problem last year.

**Farmer 1:** What did you 1 \_\_\_\_\_ ?

**Farmer 2:** I 2 \_\_\_\_\_ . I sprayed my fields with pesticides.

**Farmer 1:** I'd prefer to try a biological control rather than 3 \_\_\_\_\_ .

**Farmer 2:** What do you mean, use other insects or something like that?

**Farmer 1:** Exactly. I 4 \_\_\_\_\_ wasps. Apparently, they eat the borers.

**Farmer 2:** How can insects be better than chemical pesticides?

**Farmer 1:** 5 \_\_\_\_\_ that shows they're very effective. And I wouldn't have to worry about chemical side-effects.

**Farmer 1:** Hmm. 6 \_\_\_\_\_ if it works. I'm starting to have a problem with bollworms.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I just discovered that I have ... in my fields.  
 I sprayed my fields with pesticides.  
 How can insects be better than pesticides?*

**Student A:** Student A: You are a farmer. Talk to Student B about:

- a problem with crops
- chemical controls
- biological controls

**Student B:** You are a farmer. Talk to Student A about controlling crop problems.

## Writing

- 9 Use the conversation from Task 8 and the farmer's guide to write a farmer's memo to staff about a crop problem. Include the type of problem and the controls to be used.

# MEMO

To: All staff

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stunted



wilted

browning

stippled

## University of Jacksonville

### Extension Office: Crop and Field Problems

#### Who we are

We are **agricultural advisors** with extensive experience in diagnosing crop and field problems. Our services are available to the general public.

*What we can do for you* - We can provide technical assistance in a variety of ways ranging from advice on crop selection to on-site and laboratory diagnosis.

#### On site diagnosis

Give us a call if your plants are **stippled**, **stunted**, **wilting**, or **browning**. We attempt to establish **symptom patterns** for small groups of plants. For larger problems, we attempt to identify the **field pattern**. Once this information has been gathered, we can usually provide a definitive diagnosis using our **symptomology keys**.

#### Laboratory diagnosis

When a symptomology key does not provide a definitive diagnosis, we usually turn to lab analyses. These tests can identify if a **symptom** is caused by **biotic** or **abiotic** factors.

#### How to contact us

If you'd like to get our advice, or set up an appointment for a field or crop diagnosis, please call 888-555-0505 or send an email to [diagnosis@extension.ur.edu](mailto:diagnosis@extension.ur.edu).

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### Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are some signs that crops are failing?
- 2 What are some ways to save failing crops?

### Reading

2 Read the webpage from an agricultural extension office. Then, choose the correct answers.

- 1 What is the purpose of the webpage?
  - A to explain a diagnostic technique
  - B to offer advice on diagnosing problems
  - C to give information about services
  - D to list common causes of crop problems
- 2 Who does the office provide assistance for?
  - A college students
  - B the general public
  - C laboratory scientists
  - D agriculture professors
- 3 Which service is NOT provided?
  - A advice on growing crops
  - B on-site diagnosis of problems
  - C laboratory analysis of samples
  - D preparation of new fields

### Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |  |                      |
|--|----------------------|
| 1 — abiotic  | 4 — symptomology key |
| 2 — brown  | 5 — symptom          |
| 3 — field pattern                                  |                      |
| A to change color                                  |                      |
| B non-living                                       |                      |
| C a sign that indicates disease                    |                      |
| D a tool used to diagnose diseases                 |                      |
| E a sign of disease that occurs throughout an area |                      |





4 Fill in the blanks with the correct words and phrases from the word bank.

**Word BANK**

biotic    stunted    wilt  
stippled    symptom    pattern

- \_\_\_\_\_ leaves are covered with spots.
- A \_\_\_\_\_ plant will be much smaller than others.
- Many crop problems have \_\_\_\_\_ causes.
- The crops started to \_\_\_\_\_ in the heat.
- Researchers are analyzing the \_\_\_\_\_.

5 Listen and read the webpage from an agricultural extension office again. What happens when a symptomology key doesn't provide a definite diagnosis?

**Listening**

6 Listen to a conversation between an agricultural advisor and a farmer. Check (✓) the symptoms of the farmer's corn.

- wilting
- drying out
- browning tops
- blackened roots
- stunted growth

7 Listen again and complete the conversation.

**Advisor:** Mr. Fussel, what's the problem with your corn?  
**Farmer:** Well, 1 \_\_\_\_\_ even though I gave them plenty of water and fertilizer.  
**Advisor:** 2 \_\_\_\_\_ first noticed the problem.  
**Farmer:** That would have been 3 \_\_\_\_\_. First, I noticed the tops of some of the plants were browning.  
**Advisor:** What happened next? 4 \_\_\_\_\_?  
**Farmer:** Not that. Next, they 5 \_\_\_\_\_ slightly. That's when I 6 \_\_\_\_\_ water.

**Speaking**

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*What's the problem with your corn?*

*I noticed the tops of some of the plants were ...*

*And what happened next?*

**Student A:** You are an agricultural advisor. Ask Student B about:

- crop problems
- symptoms
- changes

**Student B:** You are a farmer. Answer Student A's questions.

**Writing**

9 Use the conversation from Task 8 to write an email to an agricultural advisor. Include: your problem, crop symptoms, and changes you've seen.

To: Farmadvisor@farmsite.com  
 From: THernandez@Hfarm.com

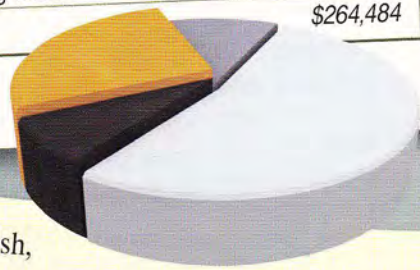
To \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Sincerely \_\_\_\_\_



## Financial Summary

<b>Revenue</b>	
Farm cash receipts	\$355,960
Investment income	\$12,435
Miscellaneous income	-
<b>Gross farm revenue</b>	<b>\$368,395</b>
<b>Expenses</b>	
<b>Total Production expenses</b>	<b>(\$168,745)</b>
Wages	(\$43,992)
<b>Feed costs</b>	<b>(\$22,081)</b>
Fuel costs	(\$7,954)
Other materials	(\$23,118)
<b>Fixed cash expenses</b>	<b>(\$34,248)</b>
Depreciation	(\$20,889)
Insurance	(\$13,359)
<b>Interest payments on loan</b>	<b>(\$70,038)</b>
<b>Non-cash expenses</b>	<b>(\$11,578)</b>
<b>Gross farm expenses</b>	<b>(\$284,609)</b>
<b>Net farm income</b>	<b>\$83,786</b>
Total farm assets	\$587,995
Total non-farm assets	\$125,877
Total outstanding <b>debt</b>	\$467,388
<b>Net worth</b>	<b>\$264,484</b>



Dear Mr. Walsh,

As per your request, I have prepared a summary of your financial position. The attached summary is based on the information you provided to Mason and Howard, LLC. It includes a summary of your revenues minus expenses. We have also calculated your net worth. The information contained in this summary will be used to prepare your federal and state income taxes. Please review to ensure that it accurately matches your records.

Should you have any questions, feel free to contact me at any time.

Sincerely,  
Glenda Mason  
Senior Accountant  
Mason and Howard, LLC

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What are the main costs and expenses of farming?
- 2 Do you think it is wiser to manage your own finances or to get professional help?

## Reading

2 Read the letter from an accountant to a farmer. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ The farmer earned \$168,745 last year.
- 2 \_\_\_ The farmer has over \$450,000 in debt.
- 3 \_\_\_ The farmer has a negative net worth.

## Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- |                                 |              |
|---------------------------------|--------------|
| 1 ___ interest payments         | 4 ___ income |
| 2 ___ gross farm revenue        | 5 ___ loan   |
| 3 ___ total production expenses |              |

- A the total of all costs  
B the sum of all money from sales  
C money that a person earns  
D money that is paid to a lender  
E money that is borrowed

4 Write a word that is similar in meaning to the underlined part.

- 1 Record all cash income from sales of farm produce and government subsidies.  
f \_ \_ \_ c \_ \_ \_ r \_ c \_ \_ \_ s
- 2 Avoid taking on money owed to a lender.  
\_ \_ b \_
- 3 When equipment loses value, it is called a cost not due to spending.  
n \_ n - \_ \_ \_ \_ \_ x \_ \_ \_ \_ e
- 4 The expenses of feeding livestock went up.  
\_ e \_ \_ c \_ \_ \_ \_
- 5 What are your expenses that don't change?  
\_ \_ x \_ \_ \_ \_ h \_ x \_ \_ \_ \_ s
- 6 Expenses increased, so gross revenue minus expenses decreased.  
n \_ \_ f \_ \_ \_ \_ n \_ \_ \_ e



- 5 Listen and read the letter from an accountant to a farmer again. What will the information in the summary be used for?

## Listening

- 6 Listen to a conversation between a farmer and an accountant. Choose the correct answers.

- 1 Why does the farmer call the accountant?  
 A to address an error  
 B to request a summary  
 C to make an appointment  
 D to ask for assistance
- 2 What will the farmer do tomorrow?  
 A create a financial summary  
 B correct the expenses section  
 C recalculate the wages information  
 D deliver information to the accountant

- 7 Listen again and complete the conversation.

**Accountant (W):** Hello, Glenda Mason speaking.

**Farmer (M):** Hi, Glenda, this is Peter Walsh. I need to talk to you about the financial summary you just sent me.

**Accountant:** Sure, I'd be glad to go over it with you.

**Farmer:** Okay, well some of the figures in the summary don't match my records.

**Accountant:** Where have you found discrepancies?

**Farmer:** Well, 1 \_\_\_\_\_ with the numbers in the expenses section.

**Accountant:** Which ones 2 \_\_\_\_\_ to you?

**Farmer:** Well, you 3 \_\_\_\_\_ \$43,992 for wages. And I have \$43,292.

**Accountant:** Okay, I've 4 \_\_\_\_\_. I'll need to review the original documents. 5 \_\_\_\_\_?

**Farmer:** Unfortunately, no.

**Accountant:** 6 \_\_\_\_\_ did you find?

**Farmer:** Your insurance figures are too low. I forgot to 7 \_\_\_\_\_ some documentation.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*Sure, I'd be glad to go over it with you.*

*Where have you found discrepancies?*

*Your insurance figures are too low.*

**Student A:** You are a farmer.

Talk to Student B about:

- your financial summary
- expense figures
- insurance figures

**Student B:** You are a farmer's accountant. Talk to Student A about a financial summary.

## Writing

- 9 Use the conversation from Task 8 and the financial summary to write a farmer's financial summary. Include: income, expenses, and debt.

### Financial Summary

\_\_\_\_\_

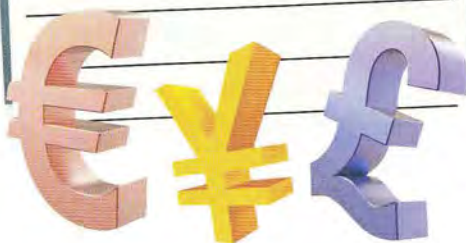
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_





## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How does international trade affect what farmers plant?
- 2 Does your country import or export more agricultural products?

### Canada

- Agricultural companies looking to start selling in global markets may look to Canada.

Canada is one of the leading exporters of agricultural goods such as wheat and other grains. But it also receives significant yearly **imports** of organic fruits and vegetables. With one of the world's healthiest economies, Canada is a major player in the **World Trade Organization** (WTO). It is an advocate of liberalized trade. Canada charges very minimal **tariffs** on imported goods. The country also applies little or no trade restriction **quotas**. One setback to sending goods to Canada is the requirement of dual language labeling, in both English and French.

### Chile

- The Republic of Chile thrives as one of South America's strongest economies based largely on **international trade**. While Chile remains **import dependent** with respect to energy related goods, it is **export dependent** overall. Recent increases in the price of copper, Chile's leading **export**, have fueled the country's financial growth. Since 2006, Chile has enjoyed a positive **balance of trade**. Despite its **trade surpluses** the country still imports large amounts of agricultural goods such as soybeans and corn. Companies importing to Chile will find a six percent tariff on all imported goods. All products imported to Chile must have labels printed in Spanish.



## Reading

2 Read the trade profile summaries. Then, mark the following statements as true (T) or false (F).

- 1  High tariffs are a setback to exporting to Canada.
- 2  Chile exports more than it imports.
- 3  Both nations require labels in two languages.

## Vocabulary

3 Fill in the blanks with the correct words and phrases from the word bank.

### word BANK

export    trade surplus  
quota    import dependent

- 1 A(n) \_\_\_\_\_ country purchases more than it sells internationally.
- 2 Wheat is a major \_\_\_\_\_ to other countries.
- 3 The government may impose a new \_\_\_\_\_.
- 4 Fewer imports led to a(n) \_\_\_\_\_.

4 Write a word that is similar in meaning to the underlined part.

- 1 Countries interact through the exchange of products across borders.  
i n \_\_\_\_\_ a \_ \_ r \_ \_
- 2 The organization that oversees trade among nations is considering some new regulations.  
\_ \_ \_
- 3 Increases in exports alter the difference between the value of exports and imports.  
b \_ \_ \_ \_ e \_ \_ t \_ \_ \_
- 4 High fees on imported or exported goods protect domestic farmers. \_ a \_ \_ \_ \_ s
- 5 Many countries depend on products brought in from other countries. \_ m p \_ \_ \_ \_
- 6 Countries that have surpluses are often reliant on selling products internationally.  
\_ x \_ \_ \_ \_ d \_ p \_ \_ \_ \_ \_







## Get ready!

## 1 Before you read the passage, talk about these questions.

- Are investments in futures markets popular in your country?
- How do changes in the futures market impact farmers?

## Falling Price of Wheat Futures

Index	Value	Change	Open	High	Low	Time
S&G	752.50	-3.00	755.50	758.00	751.50	11:34 a.m.
FRE 100	2,737.00	-43.00	2,780.00	2,788.00	2,737.00	11:35 a.m.

At week's end, **values** in the March wheat **futures market** appear to be falling. Prices fluctuated greatly throughout the week. But, Friday's values closed twelve to fifteen cents lower than when the market **opened** on Monday. This **change** is interesting news for those wishing to sell the **commodity** in the coming season.

This new **high** may be better for those who have wheat ready to sell.

But a **low** could set off a run of wheat sales in coming weeks. Last year was marked by surplus wheat production across the board, and most major wheat producers began the year with a heavy **carryover** of last year's **ending stocks**. With **beginning stock** running well above normal, the industry has suffered from unusually high **stocks-to-use ratios**. With the sudden fall of the wheat prices in every **index**, we may

see a surge in wheat purchases. This could be good news for growers of wheat.

Expected changes in weather patterns, however, may begin to affect this trend. The predicted two inches of diminished rainfall could significantly affect the year's crop yield. The first signs of such a dry season will almost certainly lead to an increase in wheat futures purchases.

## Reading

## 2 Read the article from a financial newspaper. Then, choose the correct answers.

- What is the article mainly about?
  - the effects of price changes
  - the causes of crop damage
  - the best markets to invest in
  - the expected carryover for the year
- Why is the stocks-to-use ratio high?
  - Ending stocks were low.
  - Beginning stocks were high.
  - Wheat purchases increased.
  - Carryover was lower than usual.
- What can you infer about futures purchases?
  - They limit crop production.
  - They create low carryovers.
  - They decrease when prices drop.
  - They are impacted by weather patterns.



## Vocabulary

## 3 Match the words (1-6) with the definitions (A-F).

- |             |                      |
|-------------|----------------------|
| 1 __ value  | 4 __ high            |
| 2 __ change | 5 __ low             |
| 3 __ open   | 6 __ beginning stock |

- the amount at the beginning of a year
- a smaller amount or value
- a larger amount or value
- to begin a market for the day
- monetary worth
- difference occurring over time



**4 Write a word that is similar in meaning to the underlined part.**

- 1 What is today's figure that describes average value?  
\_ n \_ \_ \_
- 2 This year's amount of stocks remaining has been unusually high. e \_ \_ \_ \_ g s \_ \_ \_ \_
- 3 Anything of value can be considered a thing that is bought, sold, or traded. c \_ \_ \_ o \_ \_ \_ \_
- 4 Last year, the amount of the previous year's stocks remaining was unusually low. c \_ \_ \_ y \_ \_ \_ \_
- 5 Carrie made a lot of money on the exchange where contracts are bought and sold.  
f \_ \_ \_ \_ e \_ \_ \_ r k \_ \_
- 6 Mark was very impressed with the carryover stock divided by total use. \_ \_ o c \_ - t \_ - \_ \_ \_ r \_ \_ \_ o

**5 Listen and read the article from a financial newspaper again. How will dryer weather affect futures purchases?**

**Listening**

**6 Listen to a conversation between a farmer and an investment analyst. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ Wheat prices have increased.
- 2 \_\_\_ The man had carryover last year.
- 3 \_\_\_ The woman suggests planting less wheat.

**7 Listen again and complete the conversation.**

**Farmer:** I heard the March wheat prices are falling.

**Analyst:** You heard correctly, fifteen cents in one week.

**Farmer:** That can't be good for us.

**Analyst:** It might not be so bad, actually.

**Farmer:** What do you mean? Lower prices means I make less money. I mean, I already planted a thousand acres of wheat. I was going to plant three thousand more. But I don't know if it's worth it now.

**Analyst:** I'd plant it 1 \_\_\_\_\_ you.

**Farmer:** With all of last year's surplus, I don't want to 2 \_\_\_\_\_. But if you think it's a good idea, I 3 \_\_\_\_\_ grow it.

**Analyst:** You did have a 4 \_\_\_\_\_ last year. But with prices so far below the index, futures will sell. Trust me.

**Farmer:** Okay. 5 \_\_\_\_\_ the three thousand acres.

**Analyst:** 6 \_\_\_\_\_. I think this trend is going to last awhile.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

*I heard ... prices are ...*  
*With prices so low, futures will sell.*  
*I think this trend is going to last a while.*

**Student A:** Student A: You are an investment analyst. Talk to Student B about:

- wheat prices
- planting crops
- confidence

**Student B:** You are a farmer. Talk to Student A about prices and planting crops.

**Writing**

**9 Use the conversation from Task 8 and the article to write a letter to a farmer. Include: changes to crop prices, how it will affect the futures market, and your recommendations for planting crops.**

Dear \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Regards \_\_\_\_\_



## Get ready!

1 Before you read the passage, talk about these questions.

- 1 What sustainable farming practices are common in your country?
- 2 What challenges does sustainable farming present?

## Reading

2 Read the flyer for a discussion on sustainable farming. Then, mark the following statements as true (T) or false (F).

- 1 \_\_\_ The focus of the event is farming basics.
- 2 \_\_\_ Mr. Arnold will receive an award at the event.
- 3 \_\_\_ JFCA speakers will address soil amendments.

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |                     |                              |
|---------------------|------------------------------|
| 1 ___ sustainable   | 4 ___ off-farm impact        |
| 2 ___ biodiversity  | 5 ___ systems perspective    |
| 3 ___ intercropping | 6 ___ non-renewable resource |

- A able to last a long time  
 B the effect of farm activities on other areas  
 C something that exists in a limited amount  
 D a broad view of the effects of agriculture  
 E the existence of a variety of organisms  
 F planting multiple crops in the same field

non-renewable resource

compost

intercropping

monoculture

## FARMING IN YOUR BACKYARD



Join the Johnson County Farmer's Association (JCFA) for a discussion on **sustainable** farming. Several experts will give lectures and answer questions. Come and enjoy free food from local farms and learn about agriculture in your community.

When: April 10th at 6:00 PM  
 Where: Johnson County Community Center  
 Admission: Free

- Fred Arnold, author of *Modern Farming*, will talk about reducing dependence on **non-renewable resources** like petroleum. The talk will cover the importance of expanding the whole community's **systems perspective**. Mr. Arnold won the JCFA's Excellence Award for improving local **economic sustainability** through alternative energy sources.
- Lisa Perry, Professor of Agriculture, will discuss methods for successful farming. Her lecture will focus on ways to make crops stronger and more reliable. Topics include the benefits of **intercropping** and the advantages of **biodiversity** over **monoculture**. Ms. Perry teaches a class on farming basics at Johnson University.

Members of the JCFA will give advice on limiting negative **off-farm impact**. The presentation will cover tips for producing your own **soil amendments** like **compost** and manure. The JCFA encourages audience members to ask questions and share their own farming techniques.



4 Read the sentence pair. Choose where the words best fit the blanks.

1 **compost / monoculture**

- A \_\_\_\_\_ is disappearing as more farmers embrace biodiversity.  
 B Using \_\_\_\_\_ is a great way to fertilize soil.

2 **economic sustainability / soil amendments**

- A A farm will fail if it lacks \_\_\_\_\_ .  
 B Most farmers add \_\_\_\_\_ to fields.

5 Listen and read the flyer for a discussion on sustainable farming again. What will Lisa Perry's lecture focus on?

## Listening

6 Listen to a conversation between a farmer and a sustainable farming expert. Choose the correct answers.

- 1 What is the man seeking advice about?  
 A preparing fields for the growing season  
 B planting two kinds of vegetables together  
 C using pesticides to get rid of flies  
 D giving a presentation on agriculture
- 2 How do onions protect carrots?  
 A pests will attack the onions instead  
 B pests do not like how the onions smell  
 C carrots' smell is masked by the onions  
 D onion leaves hide the carrot tops

7 Listen again and complete the conversation.

Farmer: Professor Perry, I 1 \_\_\_\_\_ , if you don't mind?

Speaker: 2 \_\_\_\_\_ .

Farmer: Well, I grow onions and carrots, but I've always 3 \_\_\_\_\_ fields. Do you think I should try intercropping?

Speaker: Absolutely, Ed. Onions and carrots grow 4 \_\_\_\_\_ . Onions are perfect for protecting carrots from pests.

Farmer: Really? How does that work?

Speaker: Well, 5 \_\_\_\_\_ different types of crops. You've 6 \_\_\_\_\_ attacking your carrots.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

**USE LANGUAGE SUCH AS:**

*I have a question for you, if you don't mind.*

*Do you think I should try intercropping?*

*Really? How does that work?*

**Student A:** You are a farmer. Ask Student B about:

- intercropping
- crops you grow
- avoiding pesticides

**Student B:** You are a sustainable farming expert. Answer Student A's questions.

## Writing

9 Use the conversation from Task 8 to write notes on a talk about sustainable farming. Include information about intercropping and its benefits.

### Sustainable farming

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## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How has technology improved farming in your country?
- 2 What are the negative effects of technology in farming?



GPS

overwatering

## Revolution Farm Equipment

Save time and labor by letting our mechanized solutions work for you. Call for pricing.

### Magic Dripper

Save water with this **drip irrigation system**. It features **smart irrigation control** to prevent **over watering** during rain or high wind. The Magic Dripper promotes healthy plants while using 25% less water than other leading irrigation systems.

### Intelli-Farm Tractor

Make your life easier with the latest in tractor **technology**. Do you lose focus driving your tractor back and forth for hours at a time? Improve your precision with this **auto-steer** tractor. Let **GPS** guide your plows and planters with the **self-propelled** Intelli-Farm Tractor.

### Sow Better

Planting seeds is quick and easy with the Sow Better system for **air seeding**, which accommodates a variety of seeds and bulbs. Relax and let the Sow Better start this year's crop. The Sow Better also prevents **overplanting**.

### Right-Bin

Never worry about misplacing your paperwork again. This **automated bin system** provides safe storage for your products and records. The Right-Bin keeps track of your past and current information in one easy-to-use computer database.



auto-steer system



drip irrigation



air seeding

## Vocabulary

3 Match the words (1-6) with the definitions (A-F).

- |   |                  |   |                            |
|---|------------------|---|----------------------------|
| 1 | — auto-steer     | 5 | — smart irrigation control |
| 2 | — overplanting   | 6 | — automated bin management |
| 3 | — air seeding    |   |                            |
| 4 | — self-propelled |   |                            |

- A a method for organizing harvests  
 B a method for planting seeds using compressed air  
 C planting too many seeds in an area  
 D a watering system that senses and adjusts to moisture levels  
 E able to move on its own power  
 F navigating without a human driver

## Reading

2 Read the product listing from an equipment manufacturer. Then, mark the following statements as true (T) or false (F).

- 1  Smart irrigation control uses 25% less water than other irrigation systems.
- 2  The Sow Better can plant seeds or bulbs.
- 3  The Right-Bin stores information on a computer.



4 Write a word that is similar in meaning to the underlined part.

- Giving plants more water than they need is wasteful and harmful to the plants.  
\_\_\_\_\_ a \_\_\_\_\_
- The science used to create new tools and methods is making farming more efficient.  
t \_\_\_\_\_ o \_\_\_\_\_
- New tractors have a system where the tractor navigates itself.  
a \_\_\_\_\_ t \_\_\_\_\_
- Using a system that drips water limits waste.  
d \_\_\_\_\_ i \_\_\_\_\_
- Some modern equipment is guided by a satellite navigation system. \_\_\_\_\_

5 Listen and read the product listing from an equipment manufacturer again. What does the Magic Dripper prevent?

## Listening

6 Listen to a conversation between a farmer and a salesperson. Check (✓) the features of the irrigation system mentioned.

- |  |   |
|--|---|
| 1 <input type="checkbox"/> inexpensive   | 3 <input type="checkbox"/> timers             |
| 2 <input type="checkbox"/> water sensors | 4 <input type="checkbox"/> automatic shut-off |

7 Listen again and complete the conversation.

**Salesman:** Ms. Silva, I think you'll be very impressed with this new irrigation technology.

**Farmer:** I don't know. We're happy with the 1 \_\_\_\_\_ we have now. What's so exciting about your one?

**Salesman:** Well, the Magic Dripper saves time and water. And that means it saves money, too. How often do you 2 \_\_\_\_\_ timers?

**Farmer:** Probably 3 \_\_\_\_\_ a week.

**Salesman:** This system will change that. It adjusts itself when it senses rain.

**Farmer:** That sounds nice, but that's not going to save all that much.

**Salesman:** The Magic Dripper will respond 4 \_\_\_\_\_ you or your workers can.

**Farmer:** That's 5 \_\_\_\_\_.

**Salesman:** It has sensors in the soil. So the machine knows exactly when to shut off the drippers. 6 \_\_\_\_\_ timers.

**Farmer:** Well, that does seem more effective than what we use now.

## Speaking

8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I think you'll be impressed with this ...*

*It saves time and water.*

*Well, that does seem more effective than ...*

**Student A:** Student A: You are a salesman. Talk to Student B about:

- a new irrigation system
- system parts
- benefits of the system

**Student B:** You are a farmer. Talk to Student B about irrigation systems.

## Writing

9 Use the conversation from Task 8 and the product listings to write an advertisement for a new piece of agricultural equipment. Include the equipment's uses, methods, and benefits.

MAGIC DRIPPER

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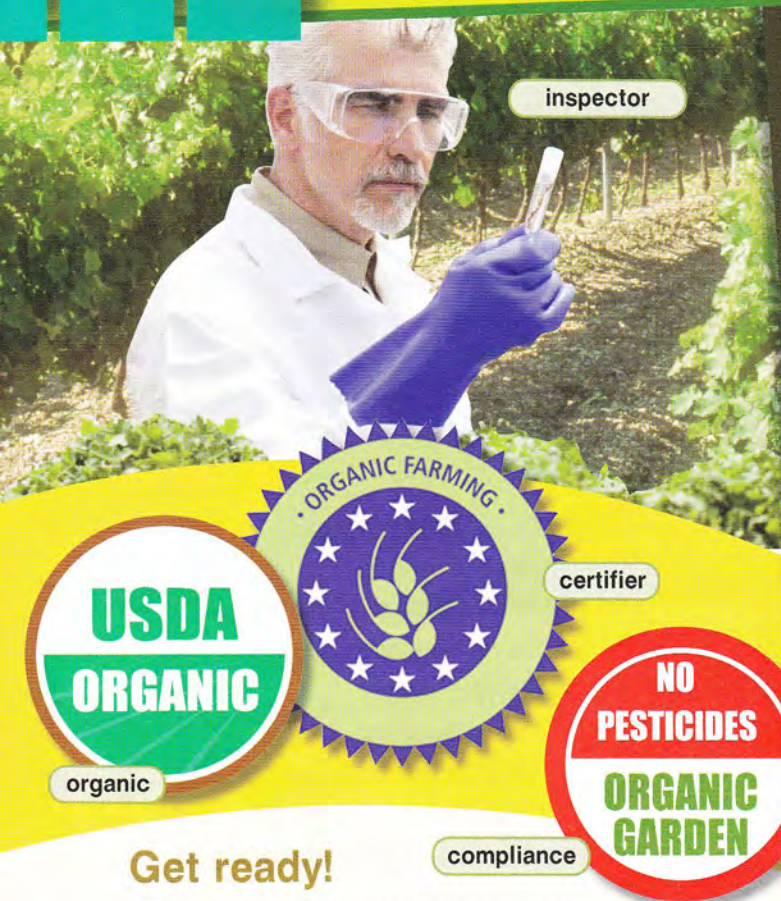
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### Get ready!

#### 1 Before you read the passage, talk about these questions.

- 1 What are the challenges of organic farming?
- 2 Are organic products popular in your country?

### Reading

#### 2 Read the publication on organic farming. Then, choose the correct answers.

- 1 What is the magazine article mainly about?
  - A organic crop growers
  - B organic farmer certification
  - C organic pest control
  - D organic farming standards
- 2 Which is NOT a type of inspector?
  - A crop inspector
  - B livestock inspector
  - C documentation inspector
  - D processing inspector
- 3 What can you infer about organic facilities?
  - A They can also produce non-organic crops.
  - B They must be inspected every year.
  - C They must report changes in material inputs.
  - D They pay membership fees to certifiers.

## Going Organic?

### What to do to get your certification

1. **Find a Certifier:** To be considered **organic**, you must comply with specified eco-friendly standards. Each **certifier** has its own guidelines, but all certifiers stress environmental sustainability and eco-friendly production practices.
2. **Apply:** Submit an application and **organic system plan** to a certifier. If the certifier approves your plan, an **inspector** will schedule a visit to observe your production facility.
3. **Prepare for Inspection:** Documentation of production must be accessible to the inspector. It is important to keep your **field activity log** up to date as the inspector will examine it.
4. **Inspection:** All inspections are performed onsite. There are three types of inspectors that specialize in examining different aspects of production.
  - Crop inspectors monitor the health of the plants, soil, and water. They also observe whether there is **compliance** with pest-control regulations.
  - Livestock inspectors judge the health of animals and their living conditions. Have vaccination reports prepared as well as a list of **material inputs**.
  - Processing inspectors check for **organic integrity** in production facilities. These inspectors assess whether there is **contamination** or **commingling** with crops from on-site non-organic fields or materials.
5. **Certification:** If your facility fulfills the organic standards you will be certified. Keep **audit trail documents** on file as proof of the organic authenticity of your products.

### Vocabulary

#### 3 Fill in the blanks with the correct words from the word bank.

Word BANK

compliance    commingle  
contamination    certifier    organic

- 1 The farm maintains \_\_\_\_\_ with regulations.
- 2 The inspector is checking for \_\_\_\_\_ of organic crops with non-organic materials.
- 3 John is preparing for a visit from the \_\_\_\_\_.
- 4 The farm offers \_\_\_\_\_ produce.
- 5 Don't \_\_\_\_\_ organic and non-organic produce.



**4 Match the words (1-6) with the definitions (A-F).**

- 1 \_\_\_ organic system plan      4 \_\_\_ inspector  
 2 \_\_\_ organic integrity        5 \_\_\_ material inputs  
 3 \_\_\_ audit trail document    6 \_\_\_ field activity log

- A someone who examines facilities, crops, and animals  
 B a written statement describing methods  
 C adhering to certifier's rule for organic products  
 D a record to prove organic authenticity  
 E a record of additives and work in fields  
 F supplies used in production

**5 Listen and read the publication on organic farming again. What are the three types of inspectors?**

**Listening**

**6 Listen to a conversation between a farmer and an organic inspector. Mark the following statements as true (T) or false (F).**

- 1 \_\_\_ The man hopes organic labels will attract attention to his produce.  
 2 \_\_\_ The woman certifies the farm as organic.  
 3 \_\_\_ The farm received a random inspection.

**7 Listen again and complete the conversation.**

**Farmer:** So, Ms. Walton, what did you think of the tour?

**Inspector:** It went well, Mr. Davis. You seemed prepared for our visit.

**Farmer:** That's good to know. We're hoping 1 \_\_\_\_\_ attention with an organic label.

**Inspector:** I understand. Organic goods are in high demand these days.

**Farmer:** Do you think we'll be certified?

**Inspector:** 2 \_\_\_\_\_. But your field activity logs showed your practices to be in compliance with our regulations.

**Farmer:** 3 \_\_\_\_\_. We've worked very hard.

**Inspector:** 4 \_\_\_\_\_. There didn't seem to be any contamination with non-organic produce.

**Farmer:** Oh, we're very careful about that. So, 5 \_\_\_\_\_ to hear if we'll be certified?

**Inspector:** 6 \_\_\_\_\_. The certifier needs to review the documents you supplied.

**Speaking**

**8 With a partner, act out the roles below based on Task 7. Then, switch roles.**

**USE LANGUAGE SUCH AS:**

- Do you think we'll be certified?*  
*There didn't seem to be any contamination ...*  
*The certifier needs to review the documents.*

**Student A:** You are a farmer. Ask Student B about:

- becoming certified
- time to respond
- what to do next

**Student B:** You are a crop inspector. Answer Student A's questions.

**Writing**

**9 Use the conversation from Task 8 and the publication to write a crop inspector's report. Include information about: field activity logs, compliance and organic integrity.**

**Report**

Name: \_\_\_\_\_  
organic inspector

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## SMITH'S SEEDS Inc.

### About Us

Smith's Seeds offers the best seeds that technology can produce. Each **biotech seed** contains favorable **traits** carefully selected by our genetic engineering team. Sustainability is important to us, and that's why we're producing more than a **conventional seed**.

### Available Seeds

**Soy #7:** This variety is characterized by both **herbicide-resistance** and **insect-resistance**. If pesky insects are affecting your crop yields, this is the seed for you. These plants will withstand many conventional herbicides.

**Wheat #5:** This variety is characterized by its incredible output. Wheat #5 seeds can be planted more closely together than conventional wheat seeds. Because these plants occupy little space, you can expect marked **yield enhancement**.

**Corn #10:** This variety is characterized by its great yields that result from **nitrogen efficiency**. These seeds will grow even in compromised soil conditions. If soil quality has decreased your corn production, Corn #10 is your solution.

**Sorghum #2:** This variety is characterized by its **drought-resistance**. If you farm in a dry area that receives irregular rainfall, this is the perfect variety for you. Expect a hardy plant and big yields from this remarkable seed.

### Safety Concerns

All of our **genetically modified organisms** (GMOs) undergo extensive **analysis** before they are sold. Our **animal performance assessments** guarantee the safety of our products.

animal performance assessment

conventional seed

analysis

## Get ready!

1 Before you read the passage, talk about these questions.

- 1 How can genetically modified organisms help farmers?
- 2 How do consumers feel about genetically modified organisms in your country?

## Reading

2 Read the webpage from a seed company. Then, mark the following statements as true (T) or false (F).

- 1  Soy #7 is designed to thrive in poor soil.
- 2  Sorghum #2 grows well in dry climates.
- 3  The company tests their products on animals.

## Vocabulary

3 Match the words (1-5) with the definitions (A-E).

- 1  drought-tolerant
  - 2  GMO
  - 3  animal performance assessment
  - 4  nitrogen efficiency
  - 5  yield enhancement
- A increasing the size of a harvest  
 B able to withstand dryness  
 C the ability to use minimal nitrogen  
 D organism produced by genetic engineering  
 E a test of the effects of a product

4 Read the sentence pair. Choose where the words best fit the blanks.

- 1 **biotech seed / analysis**  
 A This \_\_\_\_ can resist herbicides.  
 B \_\_\_\_ suggests that the product is safe.
- 2 **herbicide tolerant / insect-resistant**  
 A \_\_\_\_ seeds counter pest populations.  
 B \_\_\_\_ seeds let farmers kill weeds.
- 3 **conventional seeds / traits**  
 A Scientists are enhancing desirable \_\_\_\_.  
 B Some farmers prefer \_\_\_\_ to GMOs.



- 5 🎧 Listen and read the webpage from a seed company again. Which variety will grow in compromised soil?

## Listening

- 6 🎧 Listen to a conversation between a seed developer and a salesman. Choose the correct answers.

- 1 What is the main benefit of the seed?
- A nitrogen efficiency
  - B drought-resistance
  - C insect-resistance
  - D herbicide-resistance
- 2 Why does the woman believe the seed will benefit the environment?
- A Less land will be used per season.
  - B More farmers will plant in dry regions.
  - C Animals will have healthier feed.
  - D Less irrigation will be needed.

- 7 🎧 Listen again and complete the conversation.

- Salesman:** Carol, please come in. 1 \_\_\_\_\_ your new seed is almost ready for marketing.
- Developer:** It is. After the animal performance assessments, it will be 2 \_\_\_\_\_.
- Salesman:** Wonderful. 3 \_\_\_\_\_ . I want to know the best way to advertise it.
- Developer:** Well, the main benefit is that it's extremely 4 \_\_\_\_\_ - \_\_\_\_\_.
- Salesman:** Okay. So we'll 5 \_\_\_\_\_ it to farmers in dry regions.
- Developer:** Yes. We'll 6 \_\_\_\_\_ where rainfalls are unpredictable.
- Salesman:** Okay. What else?
- Developer:** We should emphasize the dependability of our seed. Tests showed that the yields produced during rainy seasons and those produced during droughts varied very little and they're better for the environment than conventional seeds.
- Salesman:** How?
- Developer:** With fewer crops failing during drought seasons, there'll be greater yields. That means 7 \_\_\_\_\_ per season.
- Salesman:** Excellent, Carol.

## Speaking

- 8 With a partner, act out the roles below based on Task 7. Then, switch roles.

### USE LANGUAGE SUCH AS:

*I want to know the best way to advertise it.*

*We should emphasize ...*

*Excellent point.*

**Student A:** You are a salesman. Ask Student B about:

- a new seed
- seed benefits and traits

**Student B:** You a seed developer. Answer Student A's questions.

## Writing

- 9 Use the conversation from Task 8 and the web page to write product descriptions of two new seeds. Include the crop types, seed traits, and benefits.

Crop Type: \_\_\_\_\_

Traits: \_\_\_\_\_

\_\_\_\_\_

Benefits: \_\_\_\_\_

\_\_\_\_\_

Crop Type: \_\_\_\_\_

Traits: \_\_\_\_\_

\_\_\_\_\_

Benefits: \_\_\_\_\_

\_\_\_\_\_



# Glossary

- abiotic** [ADJ-U8] If something is **abiotic**, it is a non-living thing.
- agricultural advisor** [N-COUNT-U8] An **agricultural advisor** is a professional who provides advice and support to people working in agriculture.
- air seeding** [N-UNCOUNT-U13] **Air seeding** is a method of planting seeds that uses a machine to spread seeds with a flow of air.
- analysis** [N-COUNT-U15] An **analysis** is a careful study or examination.
- animal performance assessment** [N-COUNT-U15] An **animal performance assessment** is a test that examines the effects of biotech products on animals.
- animal welfare** [N-UNCOUNT-U1] **Animal welfare** is the health and well-being of animals.
- antibiotic** [N-COUNT-U2] An **antibiotic** is a drug that is used to kill bacteria.
- audit trail document** [N-COUNT-U14] An **audit trail document** is evidence that food or other products came from an organic source.
- automated bin management** [N-UNCOUNT-U13] **Automated bin management** is a method for efficiently organizing products and tracking quantities of stock.
- auto-steer** [ADJ-U13] If a vehicle is **auto-steer**, it moves through its designated area without requiring a person to steer it.
- bacterial** [ADJ-U7] If something is **bacterial** it has to do with bacteria.
- balance of trade** [N-UNCOUNT-U10] **Balance of trade** is the difference between the total value of a country's exports and the total value of its imports.
- base temperature** [N-COUNT-U6] A **base temperature** is the minimum temperature that will allow a plant to grow.
- beginning stock** [N-UNCOUNT-U11] **Beginning stock** is the amount of stock in a given commodity with which one begins the fiscal year.
- biodiversity** [N-UNCOUNT-U12] **Biodiversity** is the existence of a variety of plants on a particular area of land.
- biological control** [N-COUNT-U7] A **biological control** is an organism such as a predatory insect used for pest management.
- biotech seed** [N-COUNT-U15] A **biotech seed** is one that has been altered by genetic engineering.
- biotechnology** [N-UNCOUNT-U4] **Biotechnology** is a branch of biology that uses living things in applied technology fields such as engineering or medicine.
- biotic** [ADJ- U8] If something is **biotic**, it is living.
- blight** [N-COUNT-U7] **Blight** is a disease that kills plants.
- body length** [N-COUNT-U1] **Body length** is the span from an animals head to its rear.
- brown** [V-I-U8] To brown is to become **brown** due to lack of water, too much heat, or disease.
- burn-down herbicide** [N-UNCOUNT-U5] A **burn-down herbicide** is a chemical used to kill weeds at the time a crop is planted.
- carryover** [N-UNCOUNT-U11] **Carryover** is what remains of a previous year's stock and the current year's production after total inventories have been depleted by use.
- certifier** [N-COUNT-U14] A **certifier** is someone who confirms that clients are meeting standards they agree to meet to be considered organic.
- change** [N-COUNT-U11] **Change** is a difference occurring over time, as in a change in position, appearance, or value.
- chute score** [N-COUNT-U1] A **chute score** is the subjective evaluation of how well an animal tolerates being forced through a chute.



**cloning** [N-UNCOUNT-U4] **Cloning** is the process of copying a biological organism or part of that organism.

**commingle** [V-I or T-U14] To **commingle** is to be mixed or sharing space.

**commodity** [N-COUNT-U11] A **commodity** is anything of monetary value to be bought sold or traded in an economic system.

**compliance** [N-UNCOUNT-U14] **Compliance** is the act of following regulations.

**compost** [N-UNCOUNT-U12] **Compost** is decaying plant material that is used as a soil amendment.

**conditioning** [N-UNCOUNT-U1] **Conditioning** is the act of altering an animal's behavior and temperament.

**conservation tillage** [N-UNCOUNT-U5] **Conservation tillage** is any practice that reduces water and soil loss associated with conventional tillage.

**consumption** [N-UNCOUNT-U3] **Consumption** is the processes of taking food into the body through the mouth.

**contamination** [N-UNCOUNT-U14] **Contamination** is when an undesirable substance mixes with a product to make it impure.

**conventional seed** [N-COUNT-U15] A **conventional seed** is one that has not been altered by genetic engineering.

**conventional tillage** [N-UNCOUNT-U5] **Conventional tillage** is the standard way of mixing and turning the soil to prepare for planting.

**crop residue** [N-COUNT-U5] **Crop residue** is the remainder of plants left in the field after farmers harvest their crops.

**crop rotation** [N-UNCOUNT-U5] **Crop rotation** is the process of growing different types of crops one after the other on the same space of land to improve soil quality.

**cropping system** [N-UNCOUNT-U5] A **cropping system** is the method a farmer uses to grow crops, such as conventional or conservation tillage.

**crowd pen** [N-COUNT-U1] A **crowd pen** is a fenced area that is used to herd animals through a squeeze chute.

**debt** [N-UNCOUNT-U9] **Debt** is the money that a person owes to a bank or other lender.

**deworming** [N-UNCOUNT-U2] **Deworming** is the act of killing or removing worms.

**diagnose** [V-T-U2] To **diagnose** an animal is to determine what is causing the animal's health problems.

**diversify** [V-I or T-U5] To **diversify** is to increase the different types of crops produced.

**drip irrigation system** [N-COUNT-U13] A **drip irrigation system** is a system for watering plants that drips water slowly over the roots of the plants.

**drought-tolerant** [ADJ-U15] If a plant is **drought-tolerant**, it can withstand extremely dry conditions.

**economic sustainability** [N-UNCOUNT-U12] **Economic sustainability** is the state of being able to continue production with consistent profits and resources.

**elevation** [N-COUNT-U6] **Elevation** is the height of an area of land relative to the level of the ocean.

**ending stock** [N-UNCOUNT-U11] **Ending stock** is the same as carryover stock, or what remains of the previous year's stocks and the current year's production after total inventories have been depleted by use.

**export** [N-COUNT-U10] An **export** is a product that a nation provides to other nations in international trade.

**export dependent** [ADJ-U10] If a nation or industry is **export dependent** it relies more upon what it sells internationally than what it sells domestically.

**expression** [N-COUNT-U4] **Expression** is the process by which genes produce traits in an organism.

**fallow** [ADJ-U5] If a field is **fallow**, it does not have any crops growing on it.

**farm cash receipts** [N-COUNT-U9] **Farm cash receipts** include the cash income resulting from the direct sale of farm products plus government subsidies.



# Glossary

- feed costs** [N-COUNT-U9] **Feed costs** are the expenses associated with providing feed to livestock.
- feed grains** [N-UNCOUNT-U3] **Feed grains** are grains that are grown for livestock to eat such as corn, sorghum, or oats.
- feed-to-food** [ADJ-U3] If a process is **feed-to-food**, it involves growing grain to feed to animals in order to produce meat for human consumption.
- field activity log** [N-COUNT-U14] A **field activity** log is a document where producers record all of the operations performed on their fields.
- field pattern** [N-COUNT-U8] A **field pattern** is the regular and repeated way that a problem occurs in a field which is used to diagnose a problem.
- fixed cash expense** [N-COUNT-U9] A **fixed cash expense** is a cost due to cash spending that generally does not change such as insurance, interest, or rent.
- flight zone** [N-COUNT-U1] A **flight zone** is an area in which a human's presence will cause an animal to move away.
- flighty** [ADJ-U1] If an animal is **flighty**, it is prone to run away.
- food grains** [N-UNCOUNT-U3] **Food grains** are grains that are grown for humans to eat such as wheat, rice, or corn.
- freeze protection** [N-UNCOUNT-U6] **Freeze protection** is the act of preventing plants from freezing.
- fungal** [ADJ-U7] If something **fungal** is has to do with fungi.
- fungicide** [N-COUNT-U7] A **fungicide** is a chemical that kills fungi.
- futures market** [N-COUNT-U11] A **futures market** is a hub of financial exchange where contracts are bought and sold for the purchase of commodities at some specified price and time in the future.
- gene** [N-COUNT-U4] A **gene** is segment of DNA that determines which traits are inherited by offspring from their parents.
- gene enhancement** [N-UNCOUNT-U4] **Gene enhancement** is the use of genetic engineering to produce desired traits in an organism beyond what is considered normal.
- genetic engineering** [N-UNCOUNT-U4] **Genetic engineering** is the act of combining genetic material from two or more organisms to produce artificial changes in genes.
- genetically modified organism** [N-COUNT-U15] A **genetically modified organism** is an organism that was produced through genetic engineering.
- GPS** [N-UNCOUNT-U13] **GPS (Global Positioning System)** is a navigation system that can identify an exact location on the Earth.
- greenhouse** [N-COUNT-U6] A **greenhouse** is a structure that is designed to retain solar energy for plant growth.
- gross farm revenue** [N-UNCOUNT-U9] **Gross farm revenue** is the total of all income a farm receives from its normal business activities.
- growing degree day** [N-COUNT-U6] A **growing degree day** is a measure of the amount of heat that a plant will receive each day in a particular area.
- growing season** [N-COUNT-U6] A **growing season** is the period of the year during which plants grow.
- handling** [N-UNCOUNT-U1] **Handling** is the act of herding and caring for animals.
- heater** [N-COUNT-U6] A **heater** is a device that generates heat by consuming fuel.
- herbicide** [N-COUNT-U7] An **herbicide** is a chemical that kills weeds.
- herbicide-tolerant** [ADJ-U15] If a plant is **herbicide-tolerant**, it can withstand the application of herbicides.
- high** [N-COUNT-U11] A **high** is a price value up from what it was at some indicated point in time.
- hoop house** [N-COUNT-U6] A **hoop house** is a temporary structure featuring a curved plastic roof that is designed to hold in heat for plant growth.



**import** [N-COUNT-U10] An **import** is a product that a nation receives from other nations in international trade.

**import dependent** [ADJ-U10] If a country or industry is **import dependent** it relies upon goods from other countries to operate effectively.

**income** [N-UNCOUNT/COUNT-U9] **Income** is the money a person earns for working or investing their money.

**index** [N-COUNT-U11] An **index** is a single figure derived from several variables in order to determine average values of given commodities at given times and in given areas.

**inedible** [ADJ-U3] If something is **inedible** it cannot be eaten.

**inefficient** [ADJ-U3] If something is **inefficient** it wastes energy.

**infectious** [ADJ-U2] If a disease is **infectious**, it is easily spread.

**insecticide** [N-COUNT-U2] An **insecticide** is a chemical that is toxic to insects.

**insect-resistant** [ADJ-U15] If a plant is **insect-resistant**, it can withstand the damages of insects.

**inspector** [N-COUNT-U14] An **inspector** is someone who examines farm facilities, crops, and animals to verify compliance with organic codes.

**intercropping** [N-UNCOUNT-U12] **Intercropping** is the process of planting two or more crops close to each other.

**interest payments** [N-COUNT-U9] **Interest payments** are money paid to a lender above the amount that has been borrowed.

**international trade** [N-UNCOUNT-U10] **International trade** is the exchange of products and services across international borders.

**land use** [N-UNCOUNT-U3] **Land use** is the human transformation of the environment to make agricultural or living areas.

**last frost date** [N-COUNT-U6] The **last frost date** is the last day in spring during which a frost may occur.

**lethargy** [N-UNCOUNT-U2] **Lethargy** is a condition of extreme weariness.

**lice** [N-COUNT-U2] **Lice** are a type of parasitic insect.

**livestock** [N-UNCOUNT-U3] **Livestock** are animals that are raised for food, labor, or to make a product such as wool.

**loan** [N-COUNT-U9] A **loan** is money that a person borrows from a bank or other lender.

**low** [N-COUNT-U11] A **low** is a price value down from what it was at some indicated point in time.

**manure** [N-UNCOUNT-U3] **Manure** is the solid waste produced by livestock that is often used for fertilizer.

**material inputs** [N-COUNT-U14] **Material inputs** are the supplies used in the production of crops or raising of livestock.

**mean temperature** [N-COUNT-U6] A **mean temperature** is the average temperature in an area.

**mechanized** [ADJ-U13] If something is **mechanized**, it is operated by machine instead of by a person.

**monitor** [V-T-U2] To **monitor** something is to check it regularly, looking for problems.

**monoculture** [N-UNCOUNT-U12] **Monoculture** is the farming of only one crop on a particular area of land.

**mulching** [N-UNCOUNT-U7] **Mulching** is the process of cutting plants into small pieces usually to put on the ground as a cover to hold in moisture.

**net farm income** [N-UNCOUNT-U9] **Net farm income** is the total gross farm income minus all expenses.

**nitrogen efficiency** [N-UNCOUNT-U15] **Nitrogen efficiency** is the ability of a plant to use little nitrogen and grow to its full potential.

**noncash expense** [N-COUNT-U9] A **noncash expense** is a cost not due to cash spending, such as amortization, depletion of supply, or depreciation.



# Glossary

- non-renewable resource** [N-COUNT-U12] A **non-renewable resource** is something that exists in fixed quantities and cannot be reproduced.
- off-farm impact** [N-UNCOUNT-U12] **Off-farm impact** is the effect of farming materials and actions on areas other than the farm.
- open** [V-T-U11] To **open** a stocks trading market is to begin it for the day.
- organic** [ADJ-U14] If food is **organic**, it is produced without unnatural fertilizers or pesticides.
- organic integrity** [N-UNCOUNT-U14] **Organic integrity** is a verification that a product is organic and not contaminated.
- organic system plan** [N-COUNT-U14] An **organic system plan** is a written statement which describes the organic methods a producer will use.
- overplanting** [N-UNCOUNT-U13] **Overplanting** is the act of planting too many seeds in an area.
- overwatering** [N-UNCOUNT-U13] **Overwatering** is the act of giving plants more water than they need.
- parasite** [N-COUNT-U2] A **parasite** is an organism that lives on or in another organism.
- pathogen** [N-COUNT-U7] A **pathogen** is any organism that causes illness or disease.
- pest management** [N-UNCOUNT-U7] **Pest management** is the practice of preventing, suppressing, or destroying organisms that harm crops.
- pesticide** [N-COUNT-U7] A **pesticide** is a chemical that kills insects and other pests harmful to crops.
- photoperiod** [N-COUNT-U6] A **photoperiod** is the amount of time each day that a plant is exposed to light.
- point of balance** [N-COUNT-U1] A **point of balance** is the spot on an animal's body that determines which way it will move in relation to the position of a herder.
- polyculture** [N-UNCOUNT-U5] **Polyculture** is a method of farming in which farmers grow several different crops together on the same piece of land.
- prohibition** [N-COUNT-U4] **Prohibition** is the act of forbidding something.
- quota** [N-COUNT-U10] A **quota** is trade restriction by which a government limits the amount or number of goods imported into a country.
- regulation** [N-COUNT-U4] A **regulation** is something that limits or controls something else.
- respiration** [N-UNCOUNT-U2] **Respiration** is the act of breathing.
- restraint** [N-COUNT-U1] A **restraint** is a device that is used to restrict movement.
- roughage** [N-UNCOUNT-U3] **Roughage** is tough plant material that animals, but not humans, can eat.
- sanitize** [V-T-U7] To **sanitize** is to clean something so that no bacteria remains.
- self-propelled** [ADJ-U13] If something is **self-propelled**, it moves by its own power.
- site selection** [N-UNCOUNT-U6] **Site selection** is the act of choosing an area to plant crops in.
- smart irrigation control** [N-UNCOUNT-U13] **Smart irrigation control** is a system for watering plants that adjusts watering based on environmental conditions.
- societal concerns** [N-UNCOUNT-U4] **Societal concerns** are worries about the potentially negative effects of new technologies.
- soil amendment** [N-COUNT-U12] A **soil amendment** is a material added to soil to improve plant growth.
- spring wheat** [N-UNCOUNT-U5] **Spring wheat** is a type of wheat that farmers plant in spring and harvest in late summer or early fall.
- squeeze chute** [N-COUNT-U1] A **squeeze chute** is a narrow fenced passage designed for passing animals through single file.



**stippled** [ADJ-U8] If a plant's leaves are **stippled**, they are covered with many little colored dots.

**stocks-to-use ratio** [N-COUNT-U11] A **stocks-to-use ratio** is the carryover stock divided by the total use.

**stunted** [ADJ-U8] If a plant is **stunted**, it is not growing as large as it should.

**suppression** [N-UNCOUNT-U7] **Suppression** is the act of reducing the amount of a pest so that it is no longer a threat.

**sustainable** [ADJ-U12] If something is **sustainable**, it can be used or continued for a long time without running out of resources.

**symptom** [N-COUNT-U8] A **symptom** is change in a plant or animal that indicates the presence of disease.

**symptom pattern** [N-COUNT-U8] A **symptom pattern** is the regular and repeated way that symptoms occur in a plant.

**symptomology key** [N-COUNT-U8] A **symptomology key** is a tool that contains potential causes of symptoms that is used in diagnosing a problem.

**systems perspective** [N-COUNT-U12] A **systems perspective** is a broad view of how farming practices affect people and the environment throughout each step of the production process.

**tariff** [N-COUNT-U10] A **tariff** is a fee applied by a national government on the import of goods in order to aid domestic industries.

**technology** [N-UNCOUNT-U13] **Technology** is the use of science to create machines or other items that increase speed and productivity.

**temperament** [N-COUNT-U1] **Temperament** is an animal's level of emotional stability.

**tick** [N-COUNT-U2] A **tick** is a type of parasitic arachnid.

**total production expenses** [N-COUNT-U9] **Total production expenses** are the combined expenses of money, time, and labor used in producing a product.

**trade surplus** [N-UNCOUNT-U10] A **trade surplus** is a positive balance of trade that occurs when the total value of a country's exports exceeds the value of its imports.

**trait** [N-COUNT-U15] A **trait** is a genetic characteristic.

**transgenic** [ADJ-U4] If a plant or animal is **transgenic** it has one or more genes artificially introduced from another plant or animal.

**vaccination** [N-COUNT-U2] A **vaccination** is an injection that gives an animal immunity to a disease.

**value** [N-UNCOUNT-U11] **Value** is how much something is worth.

**veterinarian** [N-COUNT-U2] A **veterinarian** is a doctor who specializes in animal medicine.

**weed** [N-COUNT-U7] A **weed** is an unwanted wild plant that interferes with crops growing in a field.

**weed map** [N-COUNT-U7] A **weed map** is a diagram showing the location of weeds that is used for planning a weed management program.

**wilt** [V-I-U8] (Of plants) To **wilt** is to grow weak and droop.

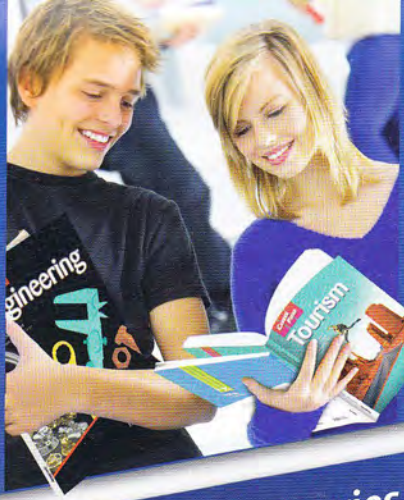
**winter wheat** [N-UNCOUNT-U5] **Winter wheat** is a type of wheat that farmers plant in fall and harvest in spring or summer.

**World Trade Organization** [N-UNCOUNT-U10] The **World Trade Organization (WTO)** is a global organization that oversees trade interactions between its participating nations with the intention of fostering negotiations and settling disputes.

**yield enhancement** [N-UNCOUNT-U15] **Yield enhancement** is an increase in the size of a harvest.

**zero tillage** [N-UNCOUNT-U5] **Zero tillage** is technique for growing crops without tilling the soil to improve soil moisture and reduce erosion.



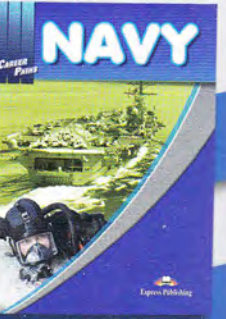
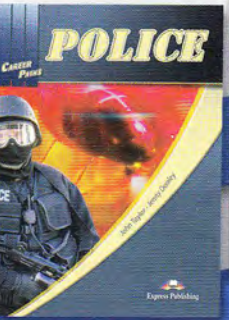
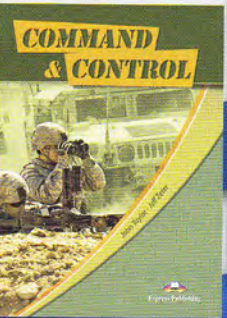
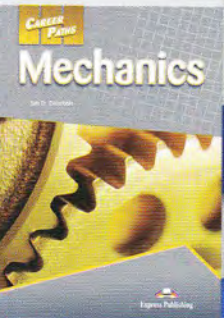
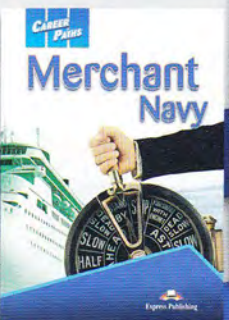
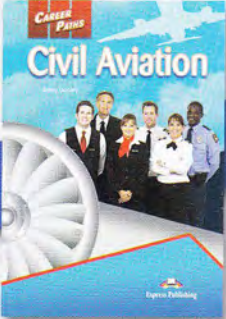
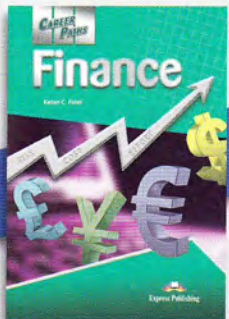
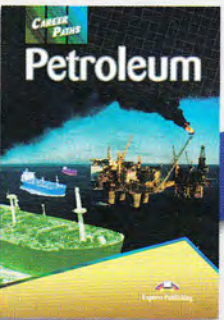
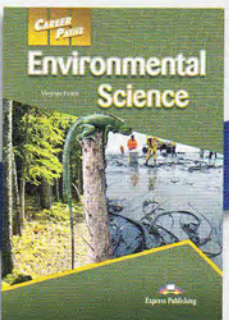
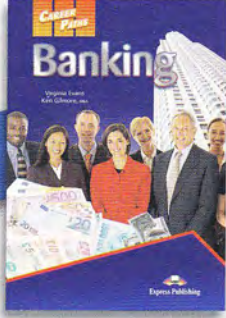
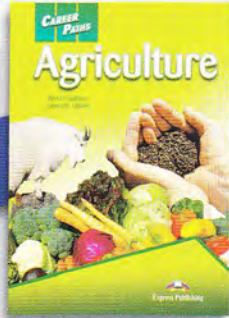
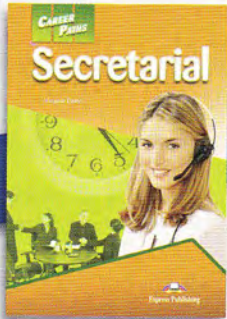
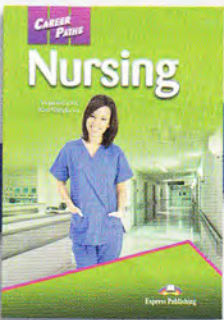
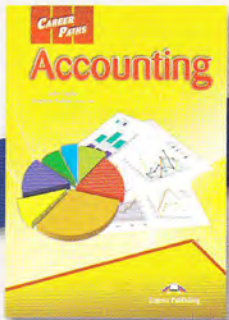
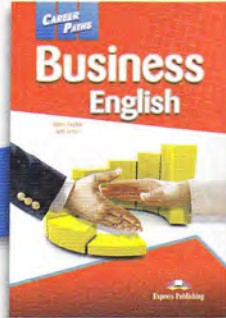
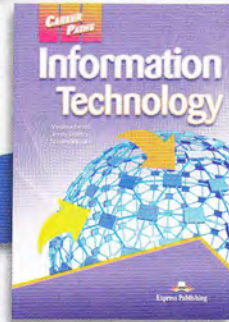
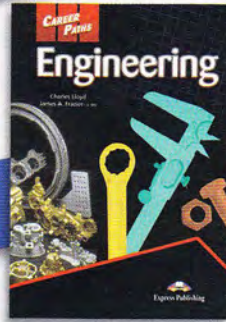
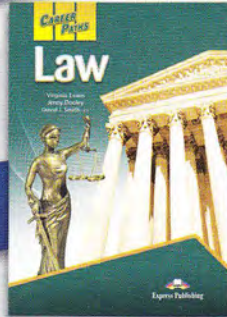
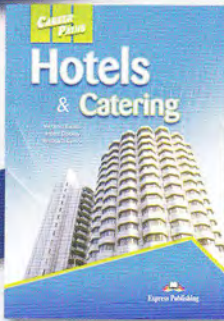
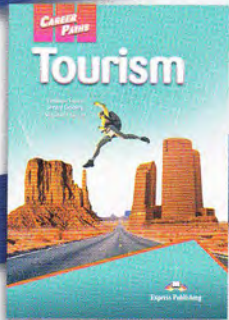


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