

1

UNIT

Urban Agriculture

WARMING UP

INTENSIVE READING

EXTENSIVE READING



Learning Objectives

By the end of this unit, you'll be able to:

- define urban agriculture and describe its benefits and challenges
- describe the applications, advantages and drawbacks of vertical farming
- read training programs efficiently
- explain a typical type of hydroponics—the NFT system
- say what expository texts are and how to translate them
- discuss issues on urban agriculture

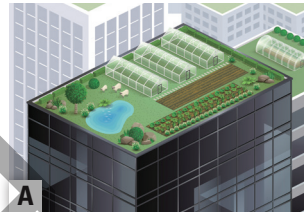
PRACTICAL READING

COMPARATIVE READING

FURTHER READING

Warming Up

Task Urban agriculture takes many kinds of forms. Here are some popular practices. Match the pictures with their names.



A



B



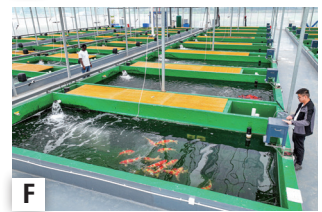
C



D



E



F

- 1 urban fish farm
- 2 chicken farm
- 3 backyard garden
- 4 community garden
- 5 greenhouse
- 6 rooftop farm

Intensive Reading



Urban agriculture

- ¹ The United Nations (UN) estimates that nearly seven billion people will be living in cities by 2050. According to a recent **publication**, urban **dwellers** consume most of the food produced globally and maintain resource-**intensive** diets, including increased animal-source and processed food, which is rich in salt, sugar, and fats. At the same time, many urban populations, **particularly** those in low-income areas, **endure acute** hunger and **malnutrition** as well as limited access to **affordable**, healthy food. Urban agriculture is one answer to the challenge.
- ² Urban agriculture can be defined as the practice of growing, processing, and **distributing** fresh food by and for people living in urban areas. It includes urban gardens and farms such as community, school, company, backyard, windowsill, rooftop and container gardens, **hydroponic** or **aquaponic** indoor production, and urban livestock farms. Urban agriculture uses waste or unused land and waters such as empty lots, tops of buildings, river banks and **steep slopes** and makes them **productive**.
- ³ Over the last few years, urban agriculture has gained in popularity due to concerns about climate change and food security in urban areas. The more people learn about the food industry, the less they want to eat processed and packaged food. They trust the food they have grown personally. The Food and Agriculture Organization (FAO) of the UN reports that several hundred million people worldwide grow fruit and vegetables or raise animals in cities, producing a certain amount of the world's food.



- 4 Actually, urban gardens and farms have many benefits. They produce cheap, fresh, healthy, and organic food for local consumers, and fight world hunger at the same time. Jobs, job training, and health education are also offered. The environment is protected because fewer food transportation miles help reduce carbon emissions and more places are covered with green crop plants. Certainly, urban agriculture contributes to the local economy and increases people's well-being.
- 5 Despite these advantages, urban agriculture also faces issues related to **zoning**, soil and water access, and **profitability**. In the long run, it will be necessary to develop urban agriculture on a **sustainable** basis.

Words & Expressions

Words

- publication /ˌpʌblɪˈkeɪʃən/ *n.* 刊物
 dweller /ˈdwelər/ *n.* 居民
 intensive /ɪnˈtensɪv/ *adj.* 密集的
 particularly /pəˈtɪkjələrli/ *adv.* 特别，尤其
 endure /mˈdʊr/ *v.* 忍耐，忍受
 acute /əˈkju:t/ *adj.* 严重的
 malnutrition /ˌmælnʊˈtrɪʃən/ *n.* 营养不良
 affordable /əˈfɔːrdəbəl/ *adj.* 负担得起的，价格合理的
 distribute /dɪˈstrɪbjʊ:t/ *v.* 分销
 hydroponic /ˌhaɪdrəʊˈpɒnɪk/ *adj.* 水培的
 aquaponic /ˌækwəˈpɒnɪk/ *adj.* 鱼菜共生的
 steep /sti:p/ *adj.* 陡峭的
 slope /sləʊp/ *n.* 斜坡
 productive /prəˈdʌktɪv/ *adj.* 多产的
 zoning /ˈzəʊnɪŋ/ *n.* (城市的) 区域规划
 profitability /ˌprɒːfəˈbɪləti/ *n.* 收益率，盈利状况
 sustainable /səˈsteɪnəbəl/ *adj.* 可持续的

Expressions

- United Nations (UN) 联合国
 gain in popularity 开始流行
 Food and Agriculture Organization (FAO)
 (联合国) 粮食及农业组织
 carbon emission 碳排放

Intensive Reading

Reading comprehension

Task 1 Read the text and answer the following questions.

- 1 What is urban agriculture?
- 2 What kinds of farms and gardens does urban agriculture include?
- 3 Why is urban agriculture becoming increasingly popular and important?
- 4 What are the benefits and challenges of urban agriculture?

Vocabulary building

Task 2 Complete the sentences with the words in the boxes.

particularly

intensive

access

maintain

productive

community

estimated

defined

rich

contribute

Word Bank

pasture *v.* 放牧

pesticide *n.* 杀虫剂

genetically modified
organism 转基因生物

concentration *n.* 浓度

- 1 It's _____ that urban agriculture could be one solution to the food supply chain breakdown brought about by the pandemic.
- 2 More and more consumers now prefer organic food that is _____ in nutrients.
- 3 The food is produced through _____ plant growing and animal raising in and around cities.
- 4 Place an order here online and we will send you an express parcel full of pastured eggs and 100 percent grass-fed beef from our _____ farm.
- 5 Green plants _____ to a better environment as well as the sound mental health of people.
- 6 The increase of population and the decrease of natural resources make it hard for urban people to have easy _____ to safe and fresh food.
- 7 Organic food is _____ as fresh or processed food produced by organic farming methods, free from chemical pesticide, fertilizers, and genetically modified organisms.
- 8 The fertile and _____ soils in this region give agricultural development a huge advantage.
- 9 Many factors such as funding, land, and labor should be considered to _____ a small-scale farm.
- 10 Air pollution affects all areas of the world, _____ those exposed to high concentrations of PM2.5.

Task 3 Study the members of the word families in the boxes and then complete each of the sentences using a word from them. The first letter has been given.

produce
producer
production
productive
productivity

consume
consumer
consumable
consumption

process
processed
processing

nutrient
nutrition
nutritional
nutritious
malnutrition

profit
profitable
profitably
profitability
profitless

Word Bank

additive *n.* 添加剂
flavoring agent 调味剂
preservative *n.* 防腐剂

- 1 Urban agriculture will be p_____ business as urban dwellers desire cheap and fresh food.
- 2 Many p_____ foods include additives for taste and appearance such as flavoring agents and preservatives.
- 3 Intensive farming methods and advanced farming technology contribute to the increasing p_____ of urban agriculture.
- 4 A n_____ diet provides enough nutrition and energy to the body.
- 5 Food safety concerns created strong c_____ demand for packaged produce and farm-to-table products this year.

Discussion

Task 4 Here are nine basic steps for beginners to build a garden. Discuss in your group what should be done in each step.

- 1) Decide what you'd like to grow.
- 2) Choose a location.
- 3) Plan your garden beds.
- 4) Buy basic garden tools.
- 5) Test your soil.
- 6) Prepare the soil.
- 7) Choose the right seeds or transplants.
- 8) Plant them with care.
- 9) Nurture your garden.



Vertical farming

- ¹ Vertical farming (VF) is the practice of growing items of produce **stacked** one above another in a closed and controlled environment. This method is especially advisable for challenging environments such as deserts, mountainside towns, and cities.
- ² Most vertical farms are either hydroponic, where vegetables are grown in a basin of water containing nutrients, or aeroponic, where plants' roots are sprayed with a mist that includes water and nutrients required to help them grow. Neither requires soil for crops to grow. Usually artificial growth lights are used, though in places with an **abundance** of natural sunlight, artificial and natural sunlight may be used in **combination**.
- ³ In some places, VF seems to be working well. Singapore, where land is scarce, imports about 90 percent of its produce. Sky Greens in Singapore, with its four-story **rotating** greenhouse, can produce tons of greens. The global **headquarters** of AeroFarms in the US is the largest indoor vertical farm in the world, and can harvest up to two million pounds of produce **annually**. In partnership with a local elementary school,

AeroFarms lets students harvest their own greens in an AeroFarms unit in their dining hall.

- 4 While VF is still **relatively** new, there are some real benefits. It can increase crop **yields**, overcome limited land area, and even reduce farming's negative impact on the environment by cutting down distance traveled in the supply chain. By controlling variables such as light, **humidity**, water, and nutrients, it achieves a year-round rather than seasonal production with **reliable** harvests. The reduced water usage **optimizes** water conservation—vertical farms use much less water than traditional ones. Labor is also greatly reduced by using robots to handle planting, harvesting, and **logistics**, solving the problems farms face from the current labor shortage in the agriculture industry.
- 5 Of course, it's not all roses when it comes to vertical farms. They sometimes require a lot of electricity to power artificial lights. Greens grown in vertical farms are more expensive because VF management needs more **initial** capital for necessary facilities and technology. Not everything can be grown in a vertical farm and usually leafy greens and tomatoes are produced.
- 6 Despite the potential they show in making urban agriculture a reality, vertical farms are still in their infancy. More studies and experiments need to be done to figure out how to make them work on a larger scale.

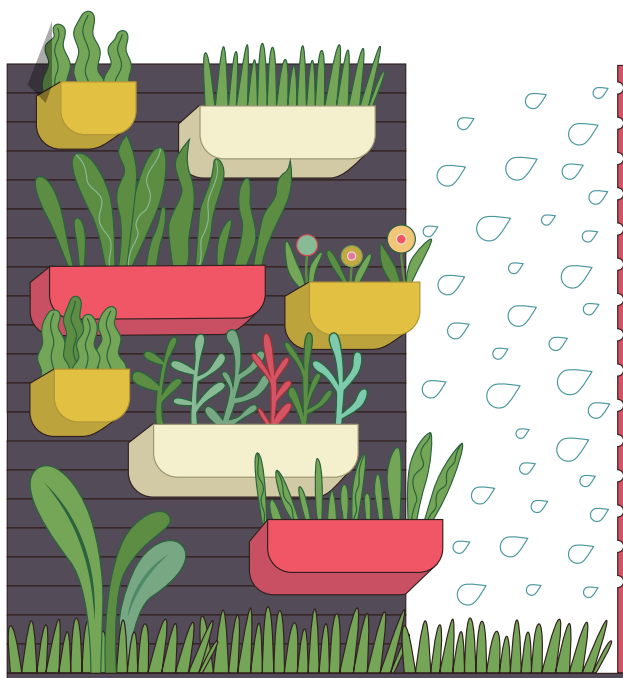
Words & Expressions

Words

vertical /'vɜ:rtɪkəl/ *adj.* 垂直的, 直立的
stack /stæk/ *v.* (使)整齐地堆起, 摞起
abundance /ə'bʌndəns/ *n.* 充裕, 丰富
combination /,kɑ:m'bə'neɪʃən/ *n.* 结合
rotate /'rəʊteɪt/ *v.* (使)旋转, (使)转动
headquarters /'hed,kwɔ:rtəz/ *n.* 总部
annually /'ænjʊəli/ *adv.* 每年一次
relatively /'relətɪvli/ *adv.* 相对地
yield /ji:ld/ *n.* 产量
humidity /hju:'mɪdəti/ *n.* 湿度
reliable /rɪ'laɪəbəl/ *adj.* 可信赖的, 可靠的
optimize /'ɑ:ptəmaɪz/ *v.* 使最优化
logistics /lou'dʒɪstɪks/ *n.* 物流
initial /ɪ'nɪʃəl/ *adj.* 初始的

Expressions

in partnership with sb 与某人有合作关系
sth is not all roses 某事不尽如人意
in one's infancy 在起步阶段



Extensive Reading

Reading comprehension

Task 1 Read the text and decide whether the following statements are true (T) or false (F).

- 1 Vertical farms only use artificial growth lights.
- 2 The largest AeroFarms building is located in Singapore.
- 3 VF can increase crop yields, overcome limited land area, save labor, and even reduce farming's impact on the environment.
- 4 Leafy greens and tomatoes are usually grown in vertical farms.
- 5 Vertical farms are already extensively developed in the world.

Vocabulary building

Task 2 Study the following compounds from the text and try to add more to the list.

- 1 greenhouse=green+house
- 2 headquarters=head+quarters
- 3 four-story=four+story
- 4 partnership=partner+ship
- 5 overcome=over+come

More:

Task 3 The meaning of a word may vary with its parts of speech. Fill in the table following the examples.

Word	First part of speech and Chinese meaning	Second part of speech and Chinese meaning
green	<i>adj.</i> 绿色的	<i>n.</i> 绿色蔬菜
increase	<i>v.</i> 增加, 增大	<i>n.</i> 增加, 增多
variable		
supply		
travel		
import		
yield		

Task 4 The meaning of a word can be inferred according to its context. Study the example and explain which parts of the following sentences can give hints about the meaning of the underlined words.

Example:

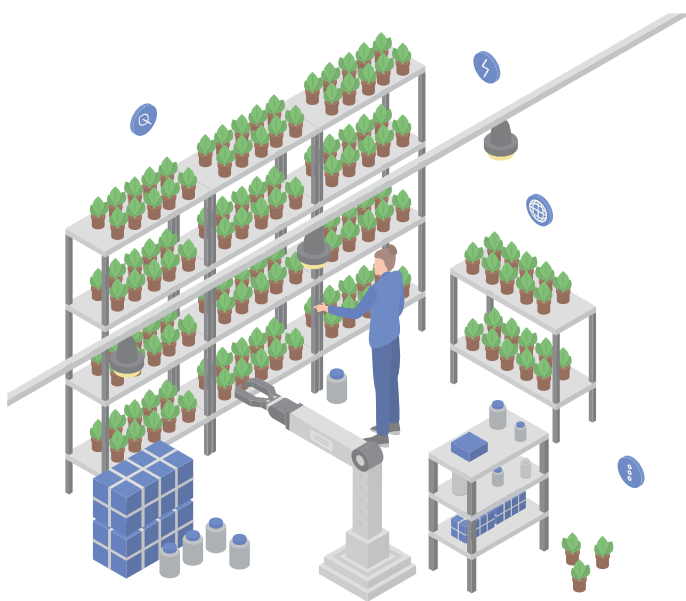
Usually artificial growth lights are used, though in places with an abundance of natural sunlight, artificial and natural sunlight may be used in combination.

This sentence shows that artificial growth lights are usually used in VF, but in places with strong sunlight, both artificial growth lights and natural sunlight may be used. So it can be inferred that “combination” means “mixture”.

- 1 This company is committed to producing great-tasting food from quality ingredients, without the use of artificial or man-made colors and flavors.
- 2 To optimize the use of natural resources, factors such as soil, water, plant and animal diversity, vegetation cover, renewable energy sources, climate, and ecosystem services should be made best use of.
- 3 The money farmers annually make on average depends on the crops they grow and market conditions in the year.
- 4 Certain plant species, especially those native to the tropics and subtropics, need higher humidity levels, while others such as cacti and succulents respond well to dry conditions.
- 5 A logistics center will be built in the Beijing–Tianjin–Hebei region next year, which will make the transportation and delivery of goods easier and faster.

Word Bank

ingredient *n.* 原料
diversity *n.* 多样性
the tropics 热带 (地区)
cacti *n. (pl.)* 仙人掌
succulent *n.* 肉质植物



Urban farmer training program

The urban farmer training program trains residents from the nearby neighborhoods, and introduces the nuts and bolts of small-scale urban farming in the city, food system building, and business planning. This training program consists of two parts.

Classroom course I



April 6–June 1 | Thursdays

6:00 p.m.–8:30 p.m.

During this course, individuals explore various aspects of urban farming such as soil quality, environmental challenges and opportunities, crop planning, organic agriculture and farm-business planning. They also engage in dialogs around building strong food systems.

The course aims to assist future educators, change makers, entrepreneurs and farmers in developing the necessary competence to effectively manage a successful urban farm and construct a healthier and more sustainable food system and environment.

(Completion of this course is required to be considered for the summer hands-on course.)

Course fee: RMB 850

Summer hands-on course II



June 5–October 20 | Monday–Friday

8:00 a.m.–6:00 p.m.

A selected number of candidates, who are interested in pursuing urban farming as an enterprise, will participate as apprentices in field training throughout the growing season. Selected candidates must have completed the classroom session and three farm-site volunteer days.

This is an opportunity to get hands-on experience of farming, and for you to see whether building an urban farm enterprise is a right choice.

Course fee: free (Monthly stipends provided!)

[Click here to sign up!](#)

✉ uftpabc@gmail.com

Reading comprehension

Task 1 Fill in the table with information from the text.

Urban farmer training program		
Subject		
Trainee		
Content		
Part	classroom course I	summer hands-on course II
Period		
Training form		
Participation requirement		
Training fee		

Words & Expressions

Words

entrepreneur /ˌɛntrəprəˈnɜːr/ *n.* 企业家

effectively /ɪˈfektɪvli/ *adv.* 有效地

hands-on /ˈhændzɔːn/ *adj.* 实际操作的, 亲身实践的

apprentice /əˈprentɪs/ *n.* 学徒

stipend /ˈstɪpənd/ *n.* 生活津贴

Expressions

the nuts and bolts of sth 某事的基本 (实质性) 要点

consist of 由……组成

engage in 参加, 参与

field training 实地培训

Vocabulary building

Task 2 Match the words with their definitions according to the text.

1 apprentice

A able to continue without causing damage to the environment

2 candidate

B a period of time used for a particular activity, especially by a group of people

3 competence

C someone who is being considered for a job or is competing in an election

4 enterprise

D the ability to do something well

5 session

E a company, organization, or business

6 sustainable

F someone who works for an employer for a fixed period of time in order to learn a particular skill or job

The planter box

Introduction

Durable material

- 1 This planter box is made of PP material, which supports the weight of soil, water, and plants without cracking. The box is resistant to high temperature and cold, and it is not affected by the weather. It can be used indoors or outdoors and is suitable for planting in the corner of your balcony, terrace, garden, backyard, or living room.

Drainage design

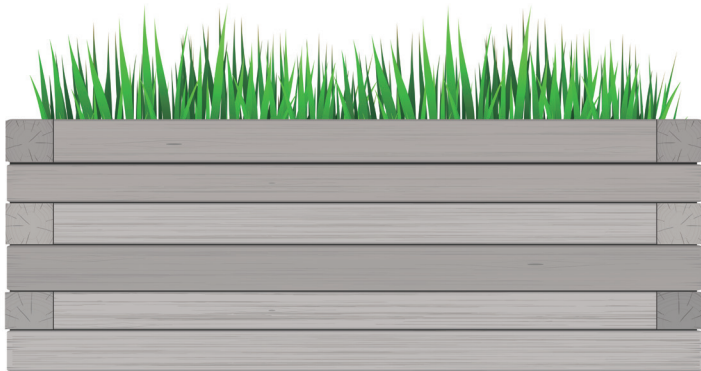
- 2 The bottom plate of the box provides enough space to store excess water. Filtering excess water from the soil and storing it in the bottom plate helps plants to completely absorb moisture and nutrients from the soil. Drainage holes make it easy to drain and will prevent your plants from rotting due to excessive moisture.

Large dimensions

- 3 The box's dimensions are 100cm × 40cm × 40cm. It provides sufficient planting space to grow plants such as vegetables and flowers.

Easy to use

- 4 The installation of this box is easy and does not require tools. You can enjoy the fun of DIY and give your plants a comfortable home.



参考译文

简介

耐用材料

该种植箱由聚丙烯材料制成，可支撑土壤、水和植物的重量而不开裂。该箱耐高温、耐寒，不受天气影响。该箱在室内或室外均可使用，且适于在阳台、露台、花园、后院或客厅的角落进行植物种植。

排水设计

该箱的底盘空间充足，可储存多余的水。多余的水分从土壤中渗出并存储于底盘中，以帮助植物完全吸收土壤中的水分和养分。排水孔方便排水，可防止植物因水分过多而腐烂。

大尺寸

该箱的尺寸为 100cm × 40cm × 40cm，为蔬菜、花卉等植物提供了足够的种植空间。

易于使用

该箱易于安装，且不需要安装工具。您可以享受自己动手的乐趣，给植物一个舒适的家。

Stylish and beautiful appearance

- 5 This box makes a great gift for parents, friends, and children. Planting and tending to vegetables and flowers can relieve the pressure of life and work. Watching plants grow from seeds day by day can help children to understand how plants grow and encourage a love of nature. It also helps the elderly to enjoy life after retirement. ↻

我的译文

Translation

Task Study the text and the translation provided. Then translate Paragraph 5 into Chinese.

Translation Tips

An expository text is usually an objective and informational text on a specific topic. It is characterized by being descriptive, illustrative, explanatory, concise, clear, cogent, unbiased, and impersonal. Examples include informational books and user's manuals.

During translation, the translator should fully comprehend the text and translate it into Chinese without the addition or omission of information. Therefore, the primary translation method applied in the translation of expository texts is literal translation (直译). At the same time, the translator should also pay attention to the style of the Chinese translation. The Chinese text should have the same expository style as the original text.

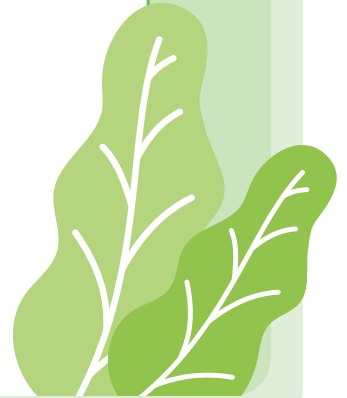
The NFT system

- ¹ Hydroponics—a method of growing food in water rather than soil—is considered as one of the approaches (方式) of sustainable agriculture. This method offers a higher yield, consumes less water, produces fewer toxins (毒素), offers continuous production (because crops can be grown and harvested all year round), and can be almost completely controlled without considering factors such as pH, light, air temperature and microorganisms.
- ² The Nutrient Film Technique (NFT, 营养液膜技术) system is the most common type of hydroponics at home and in labs, commercial settings, and vertical farms. It works by allowing a continuous nutrient stream to flow to the plants and back to the tank using a slightly downward-facing tube, without the use of a substrate (基质). The nutrient stream is pumped from the tank to the higher end of the growing chamber, where the plants are located in the hole on top. After flowing through the chamber, it will pass through the tube and return to the tank. The cycle will keep on repeating until the day of harvest.
- ³ This system has many advantages. It doesn't
- require a timer because the pump in the tank runs 24-7, and it is easy to monitor the roots' health conditions. The system also does away with the need for a growing medium. The continuous circulation of nutrient solutions avoids salt build-up in the root area, and causes less water contamination than conventional planting. Besides, the system can be scaled up for larger planting.
- ⁴ However, the system has some limits. It needs a little more maintenance as growers have to watch that the plant roots don't grow in a way that clogs (堵塞) the system. Also, they have to periodically make sure the pump is working properly to avoid potential pump failures and to ensure the plants are getting adequate nutrients.
- ⁵ Apart from the NFT system, there are also many other types of hydroponic systems like the wick system and the drip system. Due to the development of these systems, we are able to grow plants in a more sustainable way with limited resources. As technology advances, the limits of these systems will be overcome.

Project Lab

Based on what you have learned from this unit, design a urban garden or farm, and present your design to the whole class. Your design should include:

- your purpose
- location and size
- the plants you would like to grow
- arrangement of the plants
- planting methods
- workers and tools



Key vocabulary

The words and expressions I have learned in this unit are:

Reading

My newly acquired knowledge of urban agriculture includes:

Speaking

The speaking skills I have improved in this unit are:

Translation

The translation skills I have learned in this unit are:

More information

After completing this unit, I would like to know more about:

My Learning Log