

Urban Heat Islands · Student Pack

B2+ / C1

Advanced TOEFL lesson — speaking, vocabulary, listening, grammar and writing.

NAME _____

DATE _____

GROUP _____

1 Interview warm-up

SPEAKING · PAIRS

Answer each question for about 45 seconds. No preparation time. After speaking, write a few key words or a short answer in the space.

1. Describe the hottest place you have ever lived or visited. How did people cope with the heat?

2. Some people say cities should use public space for parks; others say it should be used for housing. Which do you think is more important, and why?

3. How has your neighborhood changed in the last ten years? Has it become more or less pleasant to live in?

4. Do you think your city does enough to protect people during heat waves? What could it do better?

5. If you could change one thing about the streets or buildings in your city to make summer more comfortable, what would it be? Why?

While your partner speaks, write:

One strong phrase they used:

One moment they hesitated or repeated themselves:

2 Topic vocabulary

A Match each word (1-10) to its definition (a-j). Number 0 is an example.

Example: 0. urban → **k** (relating to a city)

#	WORD	ANSWER
1.	absorb (heat)	
2.	impervious (surface)	
3.	canopy cover	
4.	mitigate	
5.	disproportionately	
6.	albedo	
7.	retrofit	
8.	exacerbate	
9.	vulnerable (populations)	
10.	cost-effective	

	DEFINITION
a	to make a problem worse
b	not allowing water to pass through
c	giving good results for the money spent
d	to add new parts or technology to an existing building
e	to take in and hold energy or liquid
f	how much light a surface reflects
g	to an unfairly or unusually large degree
h	to reduce how serious or harmful something is
i	easily harmed or affected
j	the area of ground shaded by tree leaves and branches
k	relating to a city

B Complete the paragraph with the words from Part A.

**ABSORB · IMPERVIOUS · CANOPY COVER · MITIGATE · DISPROPORTIONATELY ·
ALBEDO · RETROFIT · EXACERBATE · VULNERABLE · COST-EFFECTIVE**

Example: Dark roofs have a low **albedo**, so they reflect very little sunlight.

In many cities, summer heat is becoming a serious problem. Asphalt and concrete are **1.** _____ surfaces, so rain cannot soak into them, and they **2.** _____ heat from the sun all day long. Neighborhoods with little **3.** _____ get almost no shade from trees. Waste heat from air conditioners can **4.** _____ the problem, making hot streets even hotter. Unfortunately, heat does not affect everyone equally: it affects the elderly and outdoor workers **5.** _____, because these groups are especially **6.** _____. So how can cities **7.** _____ the effect? Painting roofs white is a **8.** _____ solution, because it is cheap and quick. Green roofs also work well, but it can be expensive to **9.** _____ older buildings so that they can carry the extra weight.

3 Academic lecture

LISTENING · NOTE-TAKING

A Before you listen. What do you think makes cities hotter than the countryside? Write two ideas.

1. _____
2. _____

B First listening. Write the main idea of the lecture in one sentence.

C Second listening. Complete the note frame.

How to take notes

1. The lecture follows the order of the rows below: first a definition, then three causes, who is affected, three solutions and the conclusion.
2. In **Claim**, write the professor's main point for that section in 2-5 words.
3. In **Evidence / example**, write one fact, number or example she gives to support it.
4. Write notes, not sentences. Abbreviations and symbols (↑, ↓, →, =, ~) are fine.

SECTION	CLAIM	EVIDENCE / EXAMPLE
<i>Example: Definition</i>	<i>city ↑ warmer than countryside around it</i>	<i>few °C on avg.; up to ~10 °C on calm, clear nights</i>
Cause 1		
Cause 2		
Cause 3		
Who is affected		
Solution 1		
Solution 2		
Solution 3		
Professor's conclusion		

D Use your notes only. Circle the best answer (a, b, c or d).

1. What is the lecture mainly about?
 - a. Why rural areas are cooling faster than cities
 - b. The causes and effects of urban heat islands and ways to reduce them
 - c. The history of air conditioning in large cities
 - d. Why green roofs are the best solution to urban heat
2. According to the professor, when is the temperature difference between cities and the countryside often largest?
 - a. In the early afternoon
 - b. On windy days
 - c. At night
 - d. In the winter
3. What does the professor say impervious surfaces are?
 - a. Surfaces that reflect most sunlight
 - b. Surfaces that water cannot soak into
 - c. Surfaces covered with plants
 - d. Surfaces that cool down quickly
4. According to the professor, why do cities often stay warm after sunset?
 - a. Air conditioners are used more at night.
 - b. Trees release warm water vapor at night.
 - c. Wind carries warm air in from the countryside.
 - d. Dark surfaces slowly release heat they absorbed during the day.
5. Why does the professor mention sweating?
 - a. To explain how plants cool the air through evaporation
 - b. To describe the health effects of heat on outdoor workers
 - c. To recommend that people drink more water in summer
 - d. To show that humans adapt to heat better than plants
6. Why does the professor describe an "ironic loop"?
 - a. Factories produce goods that make cities hotter.
 - b. Hotter cities lead to more air conditioning, which makes them hotter still.
 - c. Trees need water, but cities have less rain.
 - d. Cool roofs reflect heat back onto the roofs themselves.
7. Which group does the professor NOT mention as especially affected by urban heat?
 - a. The elderly
 - b. Outdoor workers
 - c. People without air conditioning
 - d. Young children
8. What can be inferred about lower-income neighborhoods?
 - a. They use more air conditioning than wealthier areas.
 - b. Their surfaces have a higher albedo than other areas.
 - c. Planting more trees there could reduce heat-related health risks.
 - d. They are usually located far from the city center.
9. What drawback of green roofs does the professor mention?
 - a. They can reflect heat onto pedestrians.
 - b. They take years to grow.
 - c. Older buildings may need to be retrofitted to support them.
 - d. They increase the risk of flooding.
10. What is the professor's attitude toward the three strategies?
 - a. She is confident that cool roofs alone can solve the problem.
 - b. She thinks each has limitations and that cities need a combination.
 - c. She doubts that any of them reduces temperatures.
 - d. She prefers green roofs, whatever the cost.

A 60-second summary.

Plan for 1 minute using your notes, then summarize the lecture to your partner. Cover: what an urban heat island is, two causes, who is most affected, and the professor's conclusion.

B Role cards.**How the debate works**

1. Read the situation below. Your teacher gives you ONE card.
2. **Advocates:** read your card and plan a 1-minute pitch (4 min). **Chair:** plan your questions.
3. Each advocate pitches for 1 minute. Use your strengths and answer the criticism before anyone else says it.
4. Open discussion: the Chair asks hard questions and advocates respond to each other.
5. The Chair chooses ONE option and explains the decision in 30 seconds.

*Example pitch opening: The main advantage of trees is that **they cool the street where people walk**. While it's true that **they take years to grow**, in the long run they are the most popular choice with voters.*

The situation. Your city has budget for ONE heat-reduction program in the next five years. The council meets today.

✂ Cut along the dashed lines. One card per student.

ADVOCATE**Trees and parks**

Your strengths: trees cool the street where people walk, provide shade, clean the air, and are very popular with voters.

Expect criticism: trees take many years to grow, need space in crowded streets, and need water during droughts.

ADVOCATE**Cool roofs**

Your strengths: painting roofs white or using reflective materials is cheap and fast, and helps people in buildings without air conditioning.

Expect criticism: reflective surfaces can bounce heat and glare onto pedestrians, and the benefit is less visible to voters.

ADVOCATE**Green roofs**

Your strengths: they cool buildings, absorb rainwater, reduce flooding, and support wildlife.

Expect criticism: they are expensive to install and maintain, and older buildings may need to be retrofitted to support the weight.

ADVOCATE**Cool pavements**

Your strengths: light-colored or water-permeable coatings on roads, sidewalks and parking lots cool the ground right where people walk, and can be added during normal road repairs.

Expect criticism: coatings wear off under heavy traffic and must be reapplied, they can cause glare for drivers, and there is less research on them than on trees.

ADVOCATE**Cooling centers and heat alerts**

Your strengths: air-conditioned public spaces (libraries, community centers) and text-message warnings protect vulnerable people immediately, and they use buildings the city already has.

Expect criticism: they treat the symptoms, not the cause; people must travel to reach them; and they do not make the city any cooler.

CHAIR**Council Chair**

Your job: give each advocate 1 minute, then ask hard questions: How quickly will we see results? Who benefits most? What happens if it fails?

At the end, choose ONE option and explain your decision in 30 seconds.

USEFUL LANGUAGE

The main advantage is that... / While it's true that..., ... / I'd argue that... / That's a fair point, but... / In the long run...

5 Hedging and concession

A Discovery. Underline the words that make each statement less absolute or that admit a weakness.

Example: On average, the difference **may be** just a few degrees.

1. That's largely why cities stay warm after sunset.
2. Lower-income neighborhoods tend to be hotter than wealthier ones.
3. Increasing canopy cover is probably the most popular approach. The downside is that trees take years to grow.
4. Some studies suggest cool roofs can noticeably reduce indoor temperatures.
5. Although green roofs cool buildings and absorb rainwater, they're more expensive to install.
6. Reflective surfaces can sometimes bounce heat onto pedestrians.

HEDGES (LESS CERTAIN)	CONCESSION (ADMITTING THE OTHER SIDE)
tend to, probably, likely	although / even though + clause
may, might, could, can sometimes	while it's true that...
some studies suggest / research indicates	admittedly, ...
largely, to some extent, in many cases	the downside is that...
it could be argued that...	despite + noun / -ing

B Rewrite these overconfident claims in academic style. Use a different hedge each time.

Example: Trees always cool the street. → Trees **can often** cool the street.

1. Trees solve the urban heat problem.

2. Cool roofs always reduce temperatures.

3. Poor neighborhoods are hotter than rich ones.

4. Green roofs are too expensive for any city.

5. Air conditioning causes urban heat islands.

6. Cities will be 10 degrees hotter by 2050.

C Build a Sentence. Put the chunks in the correct order. Add punctuation.

How to build a sentence: 1. Use every chunk once. Add no new words. 2. Find the subject and main verb first, then place the other chunks. 3. Start with a capital letter and end with a period.

Example: stay / cities / tend to / warm at night → **Cities tend to stay warm at night.**

1. tend to / neighborhoods / hotter / lower-income / be

2. suggest / some studies / that / cool roofs / reduce / can / indoor temperatures

3. although / expensive / green roofs / are / they absorb rainwater

4. is / probably / tree planting / the most popular / approach

5. that / the downside / is / trees / take years / to grow

Time: 10 minutes. Minimum: 100 words. Use at least two hedges and one concession.

Professor Alvarez: Many cities are considering laws that would require cool roofs or green roofs on all new buildings. Supporters say this is the most effective way to fight urban heat. Critics say the money would be better spent elsewhere, for example on planting street trees. What do you think? Why?

Maya: I support the roof requirement. New buildings are the cheapest place to add these features, because you don't have to retrofit anything. Over time, every new rooftop adds up, and the whole city benefits.

Lucas: I disagree. Roofs mainly help the people inside the building. Heat is most dangerous at street level, for people waiting for buses or working outside. Street trees protect those people directly, so I think they are a better investment.

Your response:

☒ **Peer review checklist. Tick each box for your partner's post.**

- | | |
|---|---|
| ☐ States a clear position early | ☐ Uses at least one concession |
| ☐ Adds a new idea, not a repeat of Maya or Lucas | ☐ Uses at least two words from Worksheet 2 |
| ☐ Supports it with a reason and a specific example | ☐ 100 words or more |
| ☐ Uses at least two hedges (underline them) | |

One thing your partner did well:

One thing to improve:

7 Homework — Write an Email

ABOUT 120 WORDS

Your city council is asking residents for ideas to reduce summer heat. Write an email to Councilor Ribeiro. In your email:

- describe a place in your neighborhood that gets uncomfortably hot
- propose ONE solution from today's lesson
- explain why it would be cost-effective for that location

Use a polite, formal register, at least one hedge and two words from Worksheet 2.

To: councilor.ribeiro@city.gov **Subject:**

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.