

Urban Heat Islands · Teacher's Guide

TEACHER

Lesson plan, answer keys and scripts for the Advanced TOEFL lesson pack.

i Lesson overview

2 H 1 5

ITEM	DETAIL
Level	B2+ / C1
Total time	75 min + 15 min break + 60 min
Topic	Urban heat islands: why cities are hotter than the countryside, and what to do about it
Skills	Speaking, vocabulary, listening, grammar, writing
Grammar focus	Hedging and concession in academic English
TOEFL tasks practiced	Take an Interview, Complete the Words, academic lecture listening, Build a Sentence, Academic Discussion, Listen and Repeat, Write an Email (homework)

Aims. By the end of the lesson, students can take structured notes on a 4-minute lecture, summarize it in 60 seconds, use 10 topic words with correct collocations, and write a hedged, 100+ word academic discussion post in 10 minutes.

Materials. One student pack per student, the lecture audio (see Audio) or Script A to read aloud, a timer, and phones for optional self-recording.

Prep (10 min). Print one student pack per student, cut up the debate role cards (Worksheet 4), and test the audio on the classroom speakers.

ii Teacher plan

7 STAGES

Seven stages: four before the break (75 min) and three after (60 min). Every stage reuses the lecture content, so vocabulary and ideas recycle across all skills.

#	STAGE	TIME	SKILL	INTERACTION	MATERIAL
1	Interview warm-up	10 min	Speaking	Pairs	Worksheet 1
2	Topic vocabulary	15 min	Vocabulary, reading	Individual, then pairs	Worksheet 2
3	Academic lecture	25 min	Listening, note-taking	Individual, then pairs	Worksheet 3, audio
4	Summary + city council debate	25 min	Speaking	Individual, then groups of 4-6	Worksheet 4
—	Break	15 min	—	—	—
5	Hedging and concession	20 min	Grammar	Pairs	Worksheet 5
6	Academic Discussion post	30 min	Writing	Individual, pairs, whole class	Worksheet 6
7	Listen and Repeat + homework set-up	10 min	Pronunciation, writing	Whole class	Script C, Worksheet 7

Block 1 (75 min)

Stage 1 — Interview warm-up (10 min)

1. Put students in pairs, A and B. Tell them this mirrors the TOEFL "Take an Interview" task: no preparation time, about 45 seconds per answer.
2. A asks B questions 1–5 on Worksheet 1, then they swap. Keep time and call "switch" every 45 seconds. With a short class, use questions 1–3 only.
3. After each answer, the speaker jots down a few key words in the space; the listener notes one strong phrase and one moment of hesitation.
4. Feedback (2 min): ask two or three students for the strongest phrase they heard. Board useful language for later.

Stage 2 — Topic vocabulary (15 min)

1. Students match the 10 words to their definitions alone (5 min). Item 0 (*urban* — k) is the example.
2. Pairs compare. Check answers, drill pronunciation of *albedo* /æ'l'bi:dəʊ/, *impervious* /ɪm'pɜ:rvɪəs/, *exacerbate* /ɪg'zæsəreɪt/ (3 min).
3. Students complete the Part B paragraph with the words from Part A, alone (5 min). *Albedo* is used in the example.
4. Quick check (2 min). Point out the clues that decide each gap: *can ___ the problem, making hot streets even hotter* (exacerbate, not mitigate).

Stage 3 — Academic lecture (25 min)

1. Pre-listening (2 min): students write two ideas in Part A. Collect two or three guesses.
2. First listening, gist (4 min): play the audio once. Students write the main idea in one sentence (Part B).
3. Note-frame set-up (1 min): read the four "How to take notes" steps aloud and point to the example row so students see the length of a note.
4. Second listening, notes (6 min): play again. Students complete the note frame (Part C).
5. Questions (7 min): students answer the 10 questions in Part D from their notes only. No third listening.
6. Pair check (5 min): partners compare notes and find one point one of them missed. Go through answers with the key, focusing on *why* distractors are wrong.

Stage 4 — Summary + city council debate (25 min)

1. 60-second summary (8 min): 1 minute to plan from notes, then students summarize the lecture to a partner, timed, and swap. If phones are allowed, they record themselves.
2. Debate set-up (3 min): groups of up to six. Read the five "How the debate works" steps and the example pitch opening aloud. Hand out the role cards: five advocates (Trees, Cool roofs, Green roofs, Cool pavements, Cooling centers) and one Council Chair. With smaller groups, leave out Cool pavements first, then Cooling centers.
3. Prep (4 min): advocates read their card and prepare a 1-minute pitch. The Chair prepares questions.
4. Debate (8 min): each advocate pitches (1 min), then open discussion. The Chair must pick one option and justify the decision in 30 seconds.
5. Feedback (2 min): each Chair announces the decision and the deciding reason.

Break (15 min) • Block 2 (60 min)

Stage 5 — Hedging and concession (20 min)

1. Discovery (5 min): students underline the hedging and concession language in the six lecture extracts in Part A.
2. Concept check (3 min): ask "Is the professor sure? Why might a scientist avoid saying 'always'?" Board the two categories: hedges (*tend to, probably, some studies suggest, can sometimes, largely*) and concession (*although, the downside is that, while it's true that*).
3. Controlled practice (7 min): pairs rewrite the six overconfident claims in Part B.
4. Build a Sentence (5 min): go through the three "How to build a sentence" steps and the example, then students reorder the five scrambled sentences in Part C, a direct copy of the TOEFL task format. Fastest pair writes answers on the board.

Stage 6 — Academic Discussion post (30 min)

1. Task intro (3 min): read the prompt aloud. Remind students that the TOEFL rewards a new idea, not a repeat of Maya's or Lucas's post.
2. Timed writing (10 min): strict timer. Minimum 100 words, at least two hedges and one concession.
3. Peer review (7 min): swap papers. Partners use the checklist and underline every hedge they find.
4. Class upgrade (10 min): copy two or three anonymous sentences onto the board and improve them together. Then show the model answer from the key.

Stage 7 — Listen and Repeat + homework set-up (10 min)

1. Read the seven sentences in Script C aloud, one at a time (or play them). Students repeat exactly, chorally first, then two or three individuals per sentence (6 min). Sentences get longer, so watch for dropped words and stress.
2. Homework set-up (4 min): go through the email task on Worksheet 7. Elicit one hot place in the students' own neighborhoods and which solution would suit it.

Homework. Worksheet 7, Write an Email (about 120 words).

Urban Heat Islands · Answer Key

ANSWER KEY

Answers for Worksheets 2, 3, 5 and 6. Worksheets 1, 4 and 7 are open tasks with no fixed answers.

2A VOCABULARY — MATCHING

1. absorb — e
2. impervious — b
3. canopy cover — j
4. mitigate — h
5. disproportionately — g
6. albedo — f
7. retrofit — d
8. exacerbate — a
9. vulnerable — i
10. cost-effective — c

2B VOCABULARY — PARAGRAPH

1. impervious
2. absorb
3. canopy cover
4. exacerbate
5. disproportionately
6. vulnerable
7. mitigate
8. cost-effective
9. retrofit

4 vs 7: "making hot streets even hotter" signals *exacerbate*;
"how can cities ___ the effect?" signals *mitigate*.

3B LISTENING — MAIN IDEA (SAMPLE)

Cities are warmer than surrounding rural areas because of dark surfaces, lack of vegetation and waste heat; this harms vulnerable people most, and no single solution is enough.

3C LISTENING — NOTE FRAME (SAMPLE)

SECTION	CLAIM	EVIDENCE / EXAMPLE
Definition (<i>example</i>)	City warmer than the countryside around it	A few °C on average; up to ~10 °C on calm, clear nights
Cause 1	Surfaces	Asphalt, concrete, dark roofs; impervious, low albedo; absorb by day, release at night
Cause 2	Lack of vegetation	Evapotranspiration cools air, like sweating; trees give shade
Cause 3	Human activity	Waste heat from cars, AC, factories; AC feedback loop
Who is affected	Vulnerable populations	Lower-income areas hotter, fewer trees; elderly, outdoor workers, people without AC
Solution 1	Trees and parks	Popular, cleaner air; slow to grow, need space and water
Solution 2	Cool roofs	Cheap and quick; may reduce indoor temps; can reflect heat onto pedestrians
Solution 3	Green roofs	Cool buildings, absorb rain; expensive, may need retrofiting
Conclusion	Combination needed	Adapted to local conditions

3D LISTENING — QUESTIONS

#	ANS.	TYPE	WHY THE DISTRACTORS ARE WRONG
1	b	Main idea	a and c are never discussed; d is too narrow and contradicts her conclusion.
2	c	Detail	She says the gap is often largest at night, especially on calm, clear nights.
3	b	Detail	She defines impervious as "water can't soak into them"; low reflection (a) is albedo.
4	d	Detail	AC heat (a) is a separate cause, not the night-time reason; b and c are not mentioned.
5	a	Purpose	Sweating is an analogy for evaporative cooling; workers (b) come later, in another section.
6	b	Detail	Hotter city → more AC → more waste heat → hotter city. The other options are not described as a loop.
7	d	Detail (NOT)	She names the elderly, outdoor workers and people without AC; children are not mentioned.
8	c	Inference	Lower-income areas are hotter partly because of fewer trees, so more trees could reduce risk. a, b and d are not stated.
9	c	Detail	a is a drawback of reflective surfaces; b is trees; green roofs absorb rain, so d is wrong.
10	b	Attitude	She says none is perfect on its own and most researchers argue for a combination.

5A HEDGING — DISCOVERY

1. *largely*
2. *tend to*
3. *probably; The downside is that* (concession)
4. *Some studies suggest; can*
5. *Although* (concession)
6. *can sometimes*

5C BUILD A SENTENCE

1. Lower-income neighborhoods tend to be hotter.
2. Some studies suggest that cool roofs can reduce indoor temperatures.
3. Although green roofs are expensive, they absorb rainwater. (Also accept: Although they absorb rainwater, green roofs are expensive.)
4. Tree planting is probably the most popular approach.
5. The downside is that trees take years to grow.

5B HEDGING — REWRITES (SAMPLE ANSWERS; ACCEPT ANY ACCURATE HEDGE)

1. Planting trees can significantly reduce urban heat, although it is unlikely to solve the problem on its own.
2. Cool roofs tend to reduce indoor temperatures, particularly in buildings without air conditioning.
3. Lower-income neighborhoods are often hotter than wealthier ones, partly because they tend to have fewer trees.
4. Green roofs may be too expensive for some cities, especially where older buildings would need to be retrofitted.
5. Waste heat from air conditioning is likely to exacerbate urban heat islands, but it is only one of several causes.
6. Some projections suggest that cities could become considerably hotter by 2050.

6 MODEL ACADEMIC DISCUSSION POST (ABOUT 130 WORDS)

I think both Maya and Lucas make valid points, but I would argue that the real question is not only which strategy to choose, but where to use it. Research suggests that lower-income neighborhoods tend to be hotter, partly because they have less canopy cover. A citywide roof law would mostly affect new buildings, which are probably being built in wealthier areas. Admittedly, a roof requirement costs the city very little, since developers pay for it. However, if the goal is to protect vulnerable populations, it could be more cost-effective to plant trees and install cool roofs on existing homes in the hottest neighborhoods first. In my view, a targeted approach is likely to save more lives than a general rule that mainly benefits areas that are already relatively comfortable.

Why it scores well: a new idea (location and equity) instead of simply choosing Maya or Lucas; six hedges (*would argue, suggests, tend to, probably, could be, is likely to*); one concession (*Admittedly... However*); three lesson terms (*canopy cover, vulnerable populations, cost-effective*).

Urban Heat Islands · Scripts

TEACHER

Teacher-read scripts. If the audio fails, read Script A aloud at a natural pace; it runs about 4 minutes.

A Lecture: "Urban Heat Islands"

ABOUT 560 WORDS

Professor (female), environmental science class.

Okay, let's get started. Today I want to talk about something many of you have probably felt without knowing its name: the urban heat island effect.

So, what is it? Simply put, an urban heat island is a city area that is significantly warmer than the rural areas around it. On average, the difference may be just a few degrees. But here's the surprising part: the gap is often largest at night. On calm, clear nights, some cities have been measured at up to around ten degrees Celsius warmer than the nearby countryside.

Why does this happen? There are three main causes. The first is surfaces. Cities are covered in asphalt, concrete, and dark roofs. These are what we call impervious surfaces, meaning water can't soak into them. Dark materials also have a low albedo, which means they reflect very little sunlight. Instead, they absorb heat during the day and release it slowly at night. That's largely why cities stay warm after sunset.

The second cause is the lack of vegetation. In the countryside, plants cool the air through a process called evapotranspiration. Basically, they release water vapor, and that evaporation removes heat from the air, a bit like sweating does for us. Trees also provide shade. When you replace fields and forests with buildings, you lose both effects.

The third cause is human activity itself. Cars, air conditioners, factories: they all release waste heat. And there's an ironic loop here. As cities get hotter, people use more air conditioning, which pumps more heat outside, which makes the city hotter still.

Now, why should we care? Well, heat isn't just uncomfortable. In the United States, it's the leading weather-related cause of death. And it doesn't affect everyone equally. Studies in several cities have found that lower-income neighborhoods tend to be hotter than wealthier ones, partly because they have fewer trees. So urban heat disproportionately affects vulnerable populations: the elderly, outdoor workers, and people without air conditioning.

So what can cities do? Let me mention three strategies. First, trees and parks. Increasing canopy cover is probably the most popular approach, and it brings other benefits too, like cleaner air. The downside is that trees take years to grow, and they need space and water.

Second, cool roofs. That means painting roofs white or using reflective materials. This is relatively cheap and quick. Some studies suggest cool roofs can noticeably reduce indoor temperatures, especially in buildings without air conditioning.

Third, green roofs: roofs covered with plants. Although green roofs cool buildings and absorb rainwater, they're more expensive to install and maintain. And older buildings may need to be retrofitted to support the extra weight.

Now, I want to be careful here. None of these is a perfect solution on its own. Reflective surfaces can sometimes bounce heat onto pedestrians at street level, for example. So most researchers argue that cities need a combination of strategies, adapted to local conditions.

For next class, I'd like you to think about your own city. Which of these strategies would be most cost-effective there, and why? We'll start with that discussion next time.

The lecture was about urban heat islands, which are city areas that are warmer than the countryside around them, especially at night. The professor gave three causes. First, dark, impervious surfaces like asphalt absorb heat during the day and release it at night. Second, cities have fewer plants, so they lose the cooling effect of evapotranspiration and shade. Third, cars and air conditioners release waste heat. She explained that heat disproportionately affects vulnerable people, and that poorer neighborhoods tend to be hotter. Finally, she described three solutions: trees, cool roofs and green roofs. Each has advantages and drawbacks, so she concluded that cities probably need a combination of strategies.

C Listen and Repeat

7 SENTENCES

Read each sentence once at natural speed. Students repeat it exactly.

1. Cities are getting hotter.
2. Dark roofs absorb a lot of heat.
3. Trees cool the air and provide shade.
4. Lower-income neighborhoods tend to be hotter.
5. Some studies suggest that cool roofs are cost-effective.
6. Although green roofs are expensive, they help absorb rainwater.
7. Most researchers argue that cities need a combination of strategies adapted to local conditions.

Audio

BROWSER TEXT-TO-SPEECH

All audio plays through the browser's built-in text-to-speech, using the TTS player in the Claude chat where this pack was made.

TRACK	PLAYER BUTTON	LENGTH
Script A, full lecture	Play from start	About 4 min
Script A, second half ("Now, why should we care?")	Start at part 2	About 2 min
Script C, Listen and Repeat	Play drill	About 1.5 min with gaps
Script C, one sentence again	Repeat last sentence	A few seconds

Settings. Speed 0.95× suits advanced learners and is close to TOEFL lecture pace; raise it to 1.05× for a challenge. Repeat gap 5 seconds; use 7–8 seconds for sentences 6 and 7.

Best voices. In Edge, pick a "Microsoft ... Online (Natural)" US English voice. In Chrome, pick "Google US English". Test the voice on the classroom speakers before the lesson.

In class. Do not pause during the first two listenings in Stage 3, to match test conditions. Backup: in Edge, select Script A in the doc and right-click → Read aloud selection, or read it live.