

Read the Heat

Track how an informational text builds an explanation from problem to response.

12.DSR.E “Use reading strategies as needed to aid and monitor comprehension when encountering challenging sections of text. These sense-making strategies attend to text structure, common organizational structures, summarizing...”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB As you read, underline transition words and circle one sentence you reread because it contains an important qualification or contrast. Use Paragraph Roles below to label each paragraph’s job in the explanation.

Mapping Urban Heat

- ① On a cloudless July afternoon, a city block can become far hotter than the nearby countryside. Dark asphalt absorbs solar energy, while roofs and parked cars store heat and release it slowly after sunset. This urban heat island effect is not distributed evenly: neighborhoods with fewer trees and more pavement often register higher surface temperatures. The difference matters because hot nights prevent bodies and buildings from cooling. During heat waves, residents without air conditioning, shade, or reliable transportation face greater risk of heat illness. Researchers therefore treat urban heat as both an environmental and a public-health problem.
- ② To measure that pattern, scientists combine several kinds of evidence. Satellite instruments estimate land-surface temperature, revealing which materials heat most strongly in sunlight. Ground sensors, however, record air temperature closer to where people breathe, and their readings can differ from satellite maps. Researchers also compare temperature data with tree-canopy maps, household income, age, and access to cooling centers. Each source answers a different question, so no single map proves why one neighborhood is hotter. Still, when multiple sources point to the same areas, city planners can identify places where heat exposure and social vulnerability overlap.

- ③ Cities have tested responses that work at different scales. Planting and maintaining trees can shade sidewalks and cool surrounding air through evapotranspiration, the combined movement of water into the air through evaporation from surfaces such as soil and transpiration from plants. Reflective roofs can send more sunlight back into the atmosphere than dark roofs, reducing indoor heat gain. Yet these measures require planning beyond installation. Young trees need water and protection, and a cool roof does little for a tenant whose building owner will not pay for repairs. Effective heat plans therefore pair physical changes with public cooling spaces, outreach, and policies that direct resources to residents facing the highest risk.

Paragraph Roles

Write each paragraph number and a short phrase identifying its job. Use your labels to trace the explanation's structure.

2 ANSWER WITH EVIDENCE Use the passage

- ① What is the main job of each paragraph in the author's explanation?

- ② How does the word "however" help you understand the relationship between satellite instruments and ground sensors?

- 3 Summarize the author's overall explanation in exactly two sentences. Include the problem, the evidence, and the response.

- 4 After reading the sentence that begins "Yet these measures," ask one question about a possible limitation of heat solutions. Then answer your question in one sentence using the passage.

3 YOUR TURN Your own words

Materials for Your Turn

Read and mark this companion paragraph or a challenging paragraph from another available text. Quote accurately and preserve conditions when summarizing.

Companion Text: Bleaching and Recovery

Classroom-authored paragraph based on NOAA science explanations (2024 and 2016); this is not a verbatim NOAA passage.

Reef-building corals house microscopic algae that provide much of their food and color. This partnership can break down when unusually warm water stresses the corals. They expel the algae; as a result, their pale skeletons become visible through their tissues. This whitening is called bleaching. Bleaching does not mean that a coral is already dead, but losing its main food source leaves it vulnerable to disease and starvation. If cooler conditions return soon enough to relieve the stress, algae may return and the coral may recover. However, continuing stress or prolonged algae loss can lead to death. Distinguishing immediate whitening from its possible long-term consequences explains why scientists monitor both bleaching and subsequent recovery.

Scope and limits: This paragraph focuses on heat-related bleaching. Other stressors can also trigger bleaching, and recovery is possible rather than guaranteed.

NOAA (2024), What is coral bleaching?

https://oceanservice.noaa.gov/facts/coral_bleach.html

NOAA (2016), Coral bleaching in national marine sanctuaries

<https://sanctuaries.noaa.gov/news/jun16/how-is-coral-bleaching-affecting-sanctuaries.html>

Choose a challenging paragraph from a different text you are reading. Write a 80-100-word comprehension note that identifies its organizational structure, gives a one-sentence summary, asks and answers one question using a detail from the paragraph, and explains one marking choice that helped you understand it.

Write your comprehension note

Write 80-100 words: identify the structure, give a one-sentence summary, ask and answer a text-based question, and explain a marking choice that helped you understand.

This image shows a blank 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.

PART 1 • READ AND MARK

As you read, underline transition words and circle one sentence you reread because it contains an important qualification or contrast. Use Paragraph Roles below to label each paragraph's job in the explanation. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What is the main job of each paragraph in the author's explanation?	Paragraph 1 introduces urban heat as an unequal environmental and public-health problem. Paragraph 2 explains how researchers identify high-risk areas using multiple sources of evidence. Paragraph 3 presents responses and explains why they must be supported by planning and policy.
2	How does the word "however" help you understand the relationship between satellite instruments and ground sensors?	It signals a contrast: satellite instruments measure land-surface temperature, while ground sensors measure air temperature where people breathe, so their readings may differ.
3	Summarize the author's overall explanation in exactly two sentences. Include the problem, the evidence, and the response.	The passage explains how unequal urban heat creates health risks and how researchers combine temperature and social data to identify vulnerable areas. It presents trees and reflective roofs as helpful physical responses while emphasizing maintenance, cooling access, outreach and policies that support residents facing the greatest risk.
4	After reading the sentence that begins "Yet these measures," ask one question about a possible limitation of heat solutions. Then answer your question in one sentence using the passage.	Question: Why might physical heat measures fail to protect some residents? Answer: They need maintenance, and tenants may not benefit when building owners will not pay for repairs.

PART 3 · YOUR TURN (SAMPLE ANSWER)

The paragraph about coral bleaching uses cause-and-effect structure. It explains that unusually warm water stresses corals, causing them to expel the algae that provide much of their food and color. I asked, “Does bleaching always mean a coral is dead?” The paragraph says no, because a coral may recover if cooler conditions return soon. I underlined “as a result” and circled the recovery condition. Those marks helped me separate the immediate effect, bleaching, from the possible long-term outcome, death or recovery.

Accept equivalent descriptions of the paragraph roles and the contrast between the two temperature measurements. For Part 3, accept a valid structure label, an accurate summary, a text-based question and answer, and a specific explanation of how an annotation supported comprehension. The model refers to the supplied companion paragraph. Its quoted transition “as a result” and its conditional recovery statement are printed there. Students may instead use another available text if all original note requirements are met. Do not require “only” in the two-sentence summary: the passage calls for support and maintenance without claiming that trees or roofs have no benefit otherwise. Scientific definition: evapotranspiration includes both evaporation and plant transpiration; see USGS, <https://www.usgs.gov/water-science-school/science/evapotranspiration-and-water-cycle> .