

Cooler City Choices

Use science vocabulary to explain solutions for hotter city spaces.

8.6.F “respond using newly acquired vocabulary as appropriate;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Circle the words albedo, mitigate, permeable, and canopy each time they appear. Number the nearby words that help explain what each vocabulary word means.

Designing Cooler Blocks

- ① On a hot July afternoon, Maya noticed that the sidewalk outside her apartment felt hotter than the shaded park nearby. Her science club investigated the difference. They learned about the urban heat island effect, which occurs when buildings and pavement absorb and hold more heat than trees and soil. Dark asphalt has low albedo, meaning it reflects little sunlight. As a result, city blocks can remain warm even after the sun sets, raising nighttime temperatures for nearby residents.
- ② To mitigate this heat, some cities change the surfaces they build. Crews can install light-colored roofs with higher albedo, so more solar energy returns to the atmosphere instead of warming a building. They can also replace sections of pavement with permeable materials. Unlike solid concrete, permeable pavement lets rainwater pass into the ground. The stored water can later evaporate, a process that removes heat from the surface. These choices can make sidewalks safer during heat waves and reduce flooding after storms.
- ③ Trees provide another strategy. A tree canopy is the layer of branches and leaves that shades the ground. In one study of city neighborhoods, shaded surfaces were cooler than nearby unshaded surfaces because leaves blocked incoming sunlight. Trees also release water vapor through their leaves, which can cool the surrounding air. However, planners must choose locations carefully. Young trees need regular water and space for roots. A cooling plan works best when it combines shade, reflective surfaces, and permeable ground rather than relying on one solution.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 Use the word albedo to explain why dark asphalt can make a city block stay warm.

2 How can a light-colored roof help mitigate heat? Use both mitigate and albedo in your answer.

3 What makes permeable pavement different from solid concrete, and how can that difference help a city?

4 Use canopy and permeable to explain why a city might use both trees and special pavement in one cooling plan.

3 YOUR TURN _____ Your own words

Write a three-sentence recommendation for making your school grounds cooler during hot weather. Use at least three of these words correctly: albedo, mitigate, permeable, canopy.

PART 1 • READ AND MARK

Circle the words albedo, mitigate, permeable, and canopy each time they appear. Number the nearby words that help explain what each vocabulary word means. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Use the word albedo to explain why dark asphalt can make a city block stay warm.	Dark asphalt has low albedo, so it reflects little sunlight and absorbs and holds more heat.
2	How can a light-colored roof help mitigate heat? Use both mitigate and albedo in your answer.	A light-colored roof has higher albedo, so it reflects more solar energy and helps mitigate heat in the building.
3	What makes permeable pavement different from solid concrete, and how can that difference help a city?	Permeable pavement lets rainwater pass into the ground. The water can later evaporate and remove heat, and it can also reduce flooding.
4	Use canopy and permeable to explain why a city might use both trees and special pavement in one cooling plan.	A tree canopy shades the ground, while permeable pavement lets water enter the ground and later cool the surface through evaporation.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Our school should add a tree canopy near the blacktop to shade students at lunch. It should also use a light-colored surface with higher albedo, which would mitigate the heat that builds up there. Permeable pavement along the edges could absorb rainwater and help reduce flooding.

Accept responses that use the target vocabulary accurately and connect each term to a cooling strategy described or reasonably inferred from the passage. For Part 3, accept different school-ground solutions if the response has exactly three sentences and correctly uses at least three target words.