

Module 2 – Assessment Bank

These test items are not a required component of piloting the curriculum materials. They are here as a resource that you can draw from to develop your own assessments for your students.

Multiple Choice Questions

Lesson 1: Land Use Game

1. The growth of cities is often the result of
 - A. physical factors alone
 - B. physical and social factors combined
 - C. social factors alone
 - D. none of the above
2. A brownfield is best described as a(n)
 - A. field that needs to be watered
 - B. field that has always been a park
 - C. vacant lot that was recently developed
 - D. vacant lot that has not been developed

Lesson 2: Land Use in my Field Site

1. Impervious surfaces are best described as those that are
 - A. naturally occurring
 - B. penetrable by water
 - C. not penetrable by water
 - D. man-made
2. To determine the diameter at breast height for a tree with multiple stems, you should
 - A. take the average of all stems
 - B. measure the thickest stem
 - C. move to another tree without including this one
 - D. measure the thinnest stem

Lesson 3: Biophysical and Social Drivers

1. Biophysical drivers include all of the following EXCEPT
 - A. climate
 - B. topography
 - C. nutrient cycling
 - D. land use policies

2. Social drivers include all of the following EXCEPT
 - A. economics
 - B. governance
 - C. natural history
 - D. social history

Lesson 4: Urban Sprawl

1. A city probably has more sprawl if land use increases and population density
 - A. increases
 - B. decreases
 - C. stays the same
 - D. none of the above
2. Metropolitan areas, when they are growing rapidly, tend to consume _____ land for urbanization relative to population growth
 - A. more
 - B. the same
 - C. Less
 - D. none of the above

Lesson 5: Heat Islands

1. All of the following favor the formation of heat islands EXCEPT
 - A. waterproof surfaces
 - B. dark surfaces
 - C. dense building materials
 - D. shade from trees
2. Surfaces with a higher albedo reflect _____ energy than surfaces with a lower albedo.
 - A. more
 - B. the same
 - C. less
 - D. none of the above
3. Cities are referred to as heat islands because they are so much _____ than suburban or rural areas that are nearby.
 - A. cooler
 - B. the same
 - C. warmer
 - D. none of the above

Lesson 7

1. A brownfield is best described as a(n) _____
 - A. field that needs to be watered
 - B. field that has always been a park
 - C. vacant lot that was recently developed
 - D. vacant lot that has not been developed

Short Answer and Essay

Lesson 1

1. Researchers led by Matthew Turner determined that municipal government was not as important to the rate of urban sprawl as was access to water. Discuss this finding in the context of the physical and social forces that impact the rate of urban sprawl.
2. Zoning is one way that society has developed to manage land use. How do you believe zoning affects your neighborhood? Think about what businesses, parks, residential areas, etc. that you see and do not see in your neighborhood. How do these influence what happens in your neighborhood, who lives there, what the traffic looks like, if people come to your neighborhood or pass through it, etc.

Lesson 2

1. Discuss the advantages and disadvantages to having open spaces in an urban area. Include a minimum of two advantages and two disadvantages.

Lesson 3

1. Describe how biophysical and social drivers interact to impact land use in your neighborhood and/or city. Include a minimum of one of each type of driver.

Lesson 4

1. A city called Yoube has increased its land use percentage by 20% while its population density has decreases by about 5%. You would classify Yoube as experiencing urban sprawl? Why or why not?

Lesson 5

1. Your city has been described as a heat island. What does this mean? What are some solutions to this problem? Be sure to include define the term including some discussion on albedo, the implications of being a heat island on pollution and weather, and potential solutions.

Lesson 6

1. You conducted a survey about heat islands and the community's knowledge of the science of heat islands. What did you find? Did these findings surprise you? What might you do/say to increase awareness of this issue? Why would you want to increase awareness? What solution might you offer to people to help with this issue?

Lesson 7

1. Define the term brownfield. Explain why it is often so difficult to reutilize such a site.

Lesson 8

1. Given everything that you have studied and explored about land use, describe two ways in which we might develop cities that sustain biodiversity.
2. What does it mean to identify resources as part of an action plan?

Module 2 – Assessment Bank Answers

Multiple Choice

1. Lesson 1
 - 1.1. B
 - 1.2. D
2. Lesson 2
 - 2.1. C
 - 2.2. A
3. Lesson 3
 - 3.1. D
 - 3.2. C
4. Lesson 4
 - 4.1. B
 - 4.2. A
5. Lesson 5
 - 5.1. D
 - 5.2. A
 - 5.3. C
6. Lesson 6
7. Lesson 7
 - 7.1. D

Short Answer and Essay

1.1

Students should be able to note that researchers were surprised by this finding and that water supply availability had both physical and social limitations. Cities remain compact if water access is tight. In general, land use is guided by natural characteristics of the land and behavior and culture of its residents.

1.2

Students should be able to note several examples of what they see and do not see in their neighborhoods and how these things affect their community. They should show how zoning affects land use. Some neighborhoods are full of businesses including fast food places such as MacDonald's and KFC. These businesses create a lot of traffic, noise, and pollution. They also speak to the economics of the area. Other areas may limit such establishments (for example there are suburban communities that are not zoned for MacDonald's and the like). Some urban communities have parks which might bring together residents whereas other neighborhoods do not.

2.1

Students may discuss advantages including recreation, attraction of neighbors, increased economic activity, tourism, aesthetics, etc. Disadvantages may include more open space for littering, more areas for adolescents to hang out, more areas for loitering, more potential for brownfields, etc.

3.1

Students may discuss any biophysical and social drivers as long as they relate it to their neighborhood and/or city. Biophysical drivers may include climate, nutrient cycling, geological features and topography, natural history, and ecological community composition. Social drivers may include governance, land use policies, human demography, economics, cultural practices and beliefs, social history, and aesthetics.

4.1

Yes, Yoube is experiencing urban sprawl. In general a city probably is increasing its urban sprawl if the land use percent is increasing while the population density is decreasing. The city is adding more urbanized land quicker than they are adding population.

5.1

Climate scientists refer to cities as heat islands because they are so much warmer than surrounding areas (rural and suburban). Cities tend to have darker surfaces which reflect less light and therefore absorb more energy. The hotter a city is the more air pollution increases. Researchers at Lawrence Berkeley Labs found that in Los Angeles for “every one degree hotter a city gets, the smog pollution increases by three percent.” Warmer temperatures also increase the chemical reactions taking place which may cause a rise in ozone levels. Weather patterns may also change as in the case of increased thunderstorms as the city heats up and the air pressure falls and the warm air rises only to be replaced with cooler, denser air. In addition, warmer areas may change the climate to support differing species of plants and animals. Solutions include waste energy recovery systems, waste-to-energy utilization in factories, green walls and roofs, the use of solar power systems, high-efficiency air conditioners, permeable sidewalks, planting shade trees, reserving water, and low emission vehicles.

6.1

Student responses vary. Students should include their results and whether their results surprised them. Students may find that there is little knowledge, but that this does not surprise them. Students might tell people that this issue may be reduced by their actions since most of this issue seems to be generated by human behavior. Solutions may include green walls and roofs, the use of solar power systems, high-efficiency air conditioners, permeable sidewalks, planting shade trees, reserving water, and low emission vehicles. Students may also suggest that citizens lobby for waste energy recovery systems and waste-to-energy utilization in factories, as well as the aforementioned solutions.

7.1

A brownfield is a vacant/abandoned lot that is often contaminated with hazardous substances such as petroleum, lead, and mercury. It is often very complex to reutilize these lots because they are contaminated which requires expensive clean-up and owners may be unwilling or unable to sell the land and/or clean it up. Sometimes, illegal dumping takes place on such a lot which means that the company responsible has to be determined.

Module 2 – Assessment Bank Answers

8.1

Student responses vary. Student may discuss anything in Module 2 as long as they tie it to sustaining biodiversity. Students might discuss drivers of urban land use, how increased urbanization impacts cities, how heat island are created and what the implication of such are for cities, zoning and transportation structures which may lead to fragmentation of the land, presence of brownfield, etc.

8.2

To identify resources means to identify what resources one would need to address the issue involved and where one might find these resources. For example, if you wanted to identify resources for cleaning up a schoolyard you would have to identify materials such as gloves and people power and perhaps guidelines to clean up and permission from the principal. Where one might find these resources includes local retailers, the school in terms of students, and the principal