Science 20

Unit D: Changes in Living Systems

Assignment Booklet D2

Alberta
EDUCATION

FOR TEACHER'S USE ONLY

Summary

	Total Possible Marks	Your Mark
Chapter 2 Assignment	55	

Teacher's Comments

Science 20
Unit D: Changes in Living Systems
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Chapter 2 Assignment

This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	

You may find the following Internet sites useful:

- Alberta Education, **http://www.education.gov.ab.ca**
- Learning Technologies Branch, **http://www.education.gov.ab.ca/ltb**
- Learning Resources Centre, **http://www.lrc.education.gov.ab.ca**

Exploring the electronic information superhighway can be educational and entertaining. However, be aware that these computer networks are not censored. Students may unintentionally or purposely find articles on the Internet that may be offensive or inappropriate. As well, the sources of information are not always cited and the content may not be accurate. Therefore, students may wish to confirm facts with a second source.

ASSIGNMENT BOOKLET D2
SCIENCE 20: UNIT D
CHAPTER 2 ASSIGNMENT

This Assignment Booklet is worth 55 marks out of the total 123 marks for the assignments in Unit D. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully, and record your answers in the appropriate places. If you have difficulty with an assignment, go back to the textbook and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

55

Chapter 2 Assignment: Changing Populations

For questions 1 to 3, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

(1) _____ 1. An example of a pioneer species is

A. wheat
B. ferns
C. bees
D. buffalo

(1) _____ 2. A reason for primary succession to occur in an area of Alberta today is from the effects of

A. glaciation
B. clearcut logging
C. mountain formation
D. the controlled burn of a forest

(1) _____ 3. Primary succession can be observed through aquatic succession by noting

A. changes in the numbers and types of organisms
B. the appearance of a particular organism
C. the disappearance of a particular organism
D. that no changes occurred

4. Match each description with the appropriate term listed. Place your answer in the blank space given.

i. humus	ii. primary succession
iii. pioneer species	iv. climax community

(½) _____ a. This stable community results from the process of succession.

(½) _____ b. These simple and hardy plants first colonize barren ground or rock.

(½) _____ c. This organic component of soil is created from decomposed organisms.

(½) _____ d. This is the process of changing an environment from bare rock and a few species to a complex community with many species.

(2) 5. Describe the effect of humus on the germination of seeds.

_____

_____

Return to page 12 of the Distance Learning Student Guide, and begin Lesson 2.2.

For questions 6 to 14, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 6. Secondary succession is most easily observed

A. after a forest fire
B. after the winter snow has melted
C. after a rainstorm
D. on a lava flow

Use the following information to answer questions 7 to 12.

The Okefenokee Swamp lies at the southern end of Georgia in the United States. The swamp has been declared a preserve of natural wildlife. It is a mixture of shallow water, patches of grassland, and stands of cyprus forest. These open-water areas are home to a variety of frogs and wading birds, such as herons. The acidic water is low in oxygen and contains extensive amounts of peat (partially decomposed organic matter) formed from the accumulation of dead vegetation, particularly waterweeds. The waterweeds are so prolific in some areas that they form floating islands called "batteries." These batteries provide a surface for the growth of sedges and grasses. Lizards, snakes, and shore birds, including the long-toed gallinule and the rail, can be found.

As these batteries age, organic matter builds up and compresses into peat. The peat settles to provide a more solid surface for the growth of terrestrial plants. As well, a variety of flowering plants take hold along with the pitcher plant and Venus's flytrap. Conditions gradually become suitable for ferns and small shrubs, which add to peat formation and more solid ground. Finally, given enough time, these areas become tree islands that gyrate and whip strangely in the wind, exposing the semisolid nature of the peat below. Large cyprus trees take root as these islands solidify. The trees become firmly attached with their broad-based stems and extensive roots that originate well above the ground.

This is now a truly terrestrial environment that supports deer, black bears, bobcats, raccoons, and other large vertebrates, along with a host of birds, amphibians, and reptiles. Stands of cyprus forest exist until a bolt of lightning strikes them, setting them ablaze and completely burning them along with the entire mass of peat that accumulated over the decades to form the foundation of these forests. These fires essentially reduce these treed areas to the original open water that characterizes other parts of the swamp. To prevent these natural fires from destroying the Okefenokee forests, people have built a sill (dam) at the lower end of the swamp to control drainage. Keeping the water level up prevents the forests from drying out so that fires that do occur remain localized and produce little damage. This has preserved the forests and caused more and more of the open water and grasslands of the swamp to transform into trees.

(1) _____ 7. The primary cause of succession in the swamp water is the

A. aquatic life among the weeds
B. accumulation of vegetation
C. creation of the sill
D. recurring fires

(1) _____ 8. Which factor has allowed the Okefenokee Swamp to persist and regenerate itself over the centuries?

A. the aquatic life among the weeds
B. the accumulation of vegetation
C. the creation of the sill
D. recurring fires

(1) _____ 9. What are pioneer plants in the succession?

A. patches of grassland
B. stands of cyprus forest
C. flowering plants
D. waterweeds

(1) _____ 10. What was the climax community before the sill was created?

A. patches of grassland
B. stands of cyprus forest
C. flowering plants
D. waterweeds

(1) _____ 11. What was the climax community after the sill was created?

A. patches of grassland
B. stands of cyprus forest
C. flowering plants
D. waterweeds

(1) _____ 12. The succession in the swamp is

A. primary
B. secondary
C. tertiary
D. intermediary

(1) _____ 13. An advantage of selection cutting is that it

A. lets the natural process of secondary succession unfold
B. allows for the harvesting of most timber for the lowest cost
C. breaks and damages remaining trees as selected trees are removed
D. has a very low visual impact and leaves enough vegetation to act as cover for watersheds

_____ 14. A method of forest harvesting in which mature trees are left throughout the cut-over area is known as

(1)

A. a selection cut
B. clearcutting
C. a shelterwood cut
D. a seed tree cut

(2) 15. What is the major difference between primary succession and secondary succession?

(2) 16. Describe what effect clearcutting an area of forest would have on the deer population.

Return to page 13 of the Distance Learning Student Guide, and begin Lesson 2.3.

For questions 17 to 20, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

(1) _____ 17. A line graph of the increase in the human population for both Alberta and Canada would be

A. a horizontal line
B. a straight line rising to the right
C. a straight line decreasing to the right
D. a curved line rising to the right

(1) _____ 18. Fifty moose live in a particular region in northwestern Alberta. The factors that affect the population within the region are

A. only the number of births and the number of deaths
B. only immigration and emigration
C. only the number of births and the amount of immigration
D. births, deaths, immigration, and emigration

(1) _____ 19. The population of grouse in a particular region increases and decreases every five years. The graph of the grouse population over 20 years would have the shape of

A. a straight line
B. a J-curve
C. an S-curve
D. an exponential curve

(1) _____ 20. A population of sea monkeys in a fish tank is an example of a closed population because

A. the birth rate of the sea monkeys is low
B. the carrying capacity of the fish tank is limited
C. there is a limited amount of food in the fish tank
D. there is no sea monkey immigration or emigration

21. Match each description with the appropriate term listed. Place your answer in the blank space given.

i. closed population	ii. doubling time	iii. carrying capacity
iv. open population	v. S-curve	vi. exponential curve

(½) _____ a. the maximum number of individuals that can be sustained for an indefinite time in a given ecosystem

(½) _____ b. the distinctive curve for a population that is increasing rapidly

(½) _____ c. the amount of time it takes for a population to double in size

(½) _____ d. a group of organisms that exists in a setting where immigration and emigration do not occur

(½) _____ e. the distinctive curve of the graph for a population limited by factors such as disease, competition, and famine

(½) _____ f. a group of organisms that exists in a setting where births, deaths, immigration, and emigration all affect the population numbers

Return to page 15 of the Distance Learning Student Guide, and begin Lesson 2.4.

For questions 22 to 25, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 22. Snail fossils are a good species for the fossil record because

A. snail shells are well preserved
B. snails exist in a wide variety of environments
C. snails have survived throughout Earth's history
D. all of the above

(1) _____ 23. In "Investigating the Fossil Record: Plotting Changes Over Time" from pages 490 and 491 of the textbook, what assumption had to be made to determine the approximate age of the fossil layers between layer 1 and layer 5?

A. Only one type of snail survived.
B. The rate of sedimentation was constant over the years.
C. The age of the youngest layer and the oldest layer was accurate.
D. The same number of snails existed over the years that the fossil record was examined.

(1) _____ 24. The key difference between gradualism and punctuated equilibrium is the

A. number of organisms observed
B. shape of the organism
C. rate of change
D. life span of the organism

(1) _____ 25. The process responsible for variations in the colour and banding of snail shells is

A. mutation
B. variation
C. adaptation
D. gradualism

26. Decide whether each statement is true (T) or false (F). Place your answer in the blank space given.

(½) _____ a. A mutation is always harmful to the survival of an organism.

(½) _____ b. Only a tiny fraction of snails survive from each generation.

(½) _____ c. Snails with an average of two light-coloured bands are well adapted for a habitat of low shrubs and open areas of tall grasses.

(½) _____ d. Snails with solid brown colouring would be at a disadvantage in a well-forested area.

27. Match each description with the appropriate term listed. Place your answer in the blank space given.

i. fossil record	ii. generation	iii. morphology
iv. gradualism	v. punctuated equilibrium	vi. gene
vii. mutation	viii. variation	ix. adaptation
x. fossil		

(½) _____ a. basic unit of inheritance passed down from parent to offspring

(½) _____ b. detailed shape and form of an animal

(½) _____ c. theory that changes to organisms occur slowly and steadily

(½) _____ d. record of all life on Earth as preserved by fossils

(½) _____ e. difference in the frequency of genes and traits among individual organisms within a population

(½) _____ f. single step in a line of descent of organisms

(½) _____ g. theory that changes to organisms in a population can occur in rapid spurts followed by long periods of little change

(½) _____ h. change in a genetic instruction

(½) _____ i. evidence or remains of ancient life preserved in Earth's crust

(½) _____ j. any structural trait or behavioural trait that improves an organism's success at surviving and reproducing in a particular environment

(2) 28. Describe why the Banff Springs snail is an endangered species.

_____

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_____

_____

(2) 29. Snails with light and dark bands as well as solid dark shells live in a particular ecosystem with low shrubs and tall grasses. Over time, succession changes the ecosystem from low shrubs and tall grasses to a dense canopy of tall trees. State which snails will have the best chance of survival. Explain why.

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_____

Return to page 16 of the Distance Learning Student Guide, and begin Lesson 2.5.

For questions 30 to 34, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

(1) _____ 30. Charles Darwin theorized that finches on the Galapagos Islands developed different beak types because the finches

A. came from various places with these different beak types

B. developed different beak types due to interbreeding

C. developed different beak types because they needed to adapt to the different types of food available

D. developed different beak types so they could defend themselves

(1) _____ 31. On which of the following statements did Darwin base his theory of natural selection?

A. There is variation among individuals with respect to any trait in a population.
B. Organisms usually produce more offspring than can survive.
C. Organisms within a population compete for limited resources.
D. All of the above are correct.

(1) _____ 32. The human arm, a whale flipper, and a bat wing are examples of

A. the theory of natural selection
B. Darwinian fitness
C. homologous structures
D. Lamarck's theory of evolution

(1) _____ 33. Soot deposits on the buildings and trees around Manchester, England, favoured the survival of the black moth over the peppered moth. A change in conditions in the area that favoured a return to a majority of peppered moths was

A. the removal of trees
B. the elimination of pollution
C. an introduction of more birds
D. a decrease in the bird population

(1) _____ 34. Sexual reproduction allows for

A. the mixing of both parents' traits
B. the survival of the fittest
C. an increase in variation within the population
D. all of the above

35. Match each description with the appropriate term listed. Place your answer in the blank space given.

i. theory of evolution
ii. asexual reproduction
iii. Darwinian fitness
iv. theory of natural selection

(½) _____ a. the reproductive success of an organism

(½) _____ b. a theory stating that the nature of a population gradually changes form over time

(½) _____ c. the production of identical offspring from a single parent cell by budding, by the division of a single cell, or by the division of the entire organism into two or more parts

(½) _____ d. a theory stating that evolution takes place because more organisms are produced than can survive, and only the organisms best suited to their environment survive to reproduce and pass on their advantageous traits to their offspring

(2) 36. Describe how years of drought can affect the natural selection of the type of finches (in terms of beak width) that survive.

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(4)

37. Explain the difference between Darwin's explanation of how giraffes got long necks and Lamarck's explanation. In your explanation, describe how each scientist would explain how giraffes got long necks.

Submit your completed Assignment Booklet D2 to your teacher for assessment.
Then return to page 17 of the Distance Learning Student Guide,
and begin the Chapter 2 Summary.