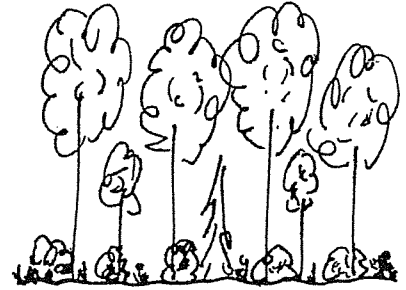


ENVIRONMENTAL STUDIES

Guide Questions

UNIT TWO: Terrestrial ecosystems

TOPIC 3: Temperate Deciduous Forest Biome



INTRODUCTION.

- (1) Describe the boundaries of the Temperate Deciduous Forest Biome. (North-South-East-West)
- (2) Name 2 characteristics of this biome, involving climate and trees.
- (3) Define the term DECIDUOUS.

ABIOTIC FACTORS.

- (4) What is the average annual precipitation? Answer in centimeters and inches. (1 inch = 2.54 cm.)
- (5) Which part of the biome receives up to 150 cm. (59 in.) per year? What is the average annual precipitation in our area? (cm. and in.)
- (6) How do temperatures change during the 4 well-developed seasons? How do they compare to temps. in the Boreal Coniferous Forest biome?
- (7) Give the average temperatures for JAN and JUL in both the Northern and Southern parts of the biome. (Give answers in both $^{\circ}\text{F}$ and $^{\circ}\text{C}$. NOTE: $^{\circ}\text{F} = (1.8 \times ^{\circ}\text{C}) + 32$ $^{\circ}\text{C} = (^{\circ}\text{F} - 32) \times 1.8$
- (8) The Climate Type for this biome is called HUMID CONTINENTAL, and is influenced by the Appalachian Mts. and the Atlantic Ocean. Give the MONTHS and DATES for the Growing Season in our area, i.e., the MONTHS and DATES for the "last frost" and the "first frost". What about the HUMIDITY during the growing season?
- (9) Compare the Average Light Intensity, and the Average Photoperiod for the Temperate Deciduous Forest and the Boreal Coniferous Forest.
- (10) What is the PHOTOPERIOD (# of HRS. of DAYLIGHT) for each of the following times of seasonal change?:

	Month/Date	Photoperiod
SUMMER SOLSTICE	<u> </u>	<u> </u>
AUTUMN EQUINOX	<u> </u>	<u> </u>
WINTER SOLSTICE	<u> </u>	<u> </u>
SPRING EQUINOX	<u> </u>	<u> </u>

- (11) How is the "nutrient-rich" layer of soil (HUMUS) produced in a deciduous forest?
- (12) What 2 processes are balanced in a typical deciduous woodland soil ("brown-earth")? Effect of each on soil nutrients?
- (13) What kind of area grows conifers and shrubs, instead of deciduous trees? What kind of habitat forms where water movement is slow?

BIOTIC FACTORS: VEGETATION.

- (14) Before the Temperate Deciduous Forest region of America was settled by European colonists, the eastern half of the USA was a vast expanse of forest, from the Mississippi River to the Atlantic Coast. In what ways did the settlers affect the forest and its wildlife species?
- (15) What 3 main types of deciduous forest make up the biome? What factors determine the types of trees in each?
- (16) Describe the boundaries of the moister and cooler Northern Hardwood Forest type?
- (17) Name 6 species of deciduous trees, and 2 species of conifers common in the eastern part of this forest.
- (18) What tree species are found toward the west of the region? From Central Wisconsin & Minnesota to Missouri?
- (19) What 3 forest types make up the Central Hardwood Forest? Name the dominant tree species in each.
- (20) What National Park in North Carolina & Tennessee, in the Cove Hardwood Forest, has a forest ranking high in quality on earth?
- (21) Which of the 3 Central Hardwood Forest types is found in the drier upland regions? Name 4 OAK species, and 4 CONIFER species.
- (22) Explain the ecological disaster that happened in the Pine-Oak Forest region. Name the disease, its cause, and the tree species that was destroyed. Where did the disease come from?
- (23) What happened to the American Elm tree? Name the disease and the insect that spread it.
- (24) Where is the Oak-Hickory forest type found in the Central Hardwood Forest region?
- (25) Where is the Southeast Pine-Oak Forest located in the Eastern USA? What kind of soil in this region is favorable for the growth of Pine trees?
- (26) What must happen in order for the dominant Pine trees to change to dominant Oak trees?
- (27) Name 3 pine tree species that dominate the Northern areas? The Southern areas?

OTHER VEGETATION IN THE DECIDUOUS FOREST

- (28) Comment on the GROWING SEASON, MOISTURE and SOIL in the Temperate Deciduous Forest, which are responsible for the wide variety of plant species other than trees.
- (29) Name the 4 major STRATA (vertical layers) in a mature deciduous forest.
- (30) What is the advantage of deciduous trees having "broad leaves"?
- (31) What kinds of plants are found in the SHRUB and GROUND layers?
- (32) What % of the sunlight received by the forest CANOPY reaches the GROUND layer? What kind of plant adaptations are found at the GROUND level?
- (33) How do ground level plants adapt to light in the Springtime?

WHY DECIDUOUS TREES DROP THEIR LEAVES

- (34) Besides frost and dry winter winds, why do deciduous trees shed their leaves in Autumn?
- (35) Explain how falling temperatures and shorter days (photo-period) cause leaves to fall.
- (36) What happens to deciduous trees in the Spring, before the leaves fully grow back? In what 2 ways are trees pollinated? Why are the fruits and seeds of trees important to the forest ecosystem?
- (37) Name the 4 main leaf PIGMENTS, and the fall colors they produce?
- (38) What do forest birds eat in winter? What do non-seed eating birds do before winter arrives? What about amphibians, reptiles, and mammals?
- (40) What kind of animal activity occurs in spring and early summer?

HUMAN IMPACT ON THE DECIDUOUS FOREST

- (41) What kind of forest has taken the place of large tracts that existed before humans settled the Deciduous Forest Biome? What kind of human activities have altered the original forest?
- (42) Why are many of the forestlands slowly returning in the Eastern USA?
- (43) Why are tree farms and monoculture not bringing back the "original" forest?
- (44) What effect does urban sprawl and highways have on forest ecosystems? Name some other human activities that are destroying eastern forestland.
- (45) List some of the importances of small woodlots (small tracts of forest) in terms of ecology, economy, and sociology in the East?
- (46) What effect has poor management had on the value of woodlots? What kinds of things should be done to correct this situation?

