

Chapter 27 Ap Biology Reading Guide Answers

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Chapter 27 Ap Biology Reading Guide Answers Fred Chapter 27 Plant Diversity I How Plants Colonized Land AP Biology Reading Guide Answers This reading guide will help you understand the key concepts and terms covered in Chapter 27 of your AP Biology textbook focusing on the evolution and diversification of plants I The Move to Land A Major Evolutionary Event A What are some of the challenges and opportunities faced by plants as they transitioned from an aquatic to a terrestrial environment Challenges Water Availability Land is drier than water so plants need to develop ways to conserve water and obtain it from the soil Structural Support Water provides buoyancy so plants needed to develop rigid structures for support against gravity Reproduction Water helps with dispersal of gametes so plants needed to find new ways to reproduce on land Protection from UV Radiation The atmosphere filters less UV radiation on land requiring plants to evolve protective mechanisms Opportunities Access to Sunlight Plants can obtain more direct sunlight on land increasing photosynthetic efficiency Uncrowded Environment Land offered fewer competitors and predators compared to aquatic environments New Nutrient Sources Land provided access to different minerals and nutrients not available in water B What are the four major groups of plants and what are the key characteristics of each group Bryophytes Nonvascular Plants Characteristics Lack vascular tissue require moist environments for reproduction small in size lack true roots stems and leaves 2 Examples Mosses liverworts hornworts Pteridophytes Seedless Vascular Plants Characteristics Possess vascular tissue xylem and phloem for transport can grow larger have true roots stems and leaves Reproduce via spores Examples Ferns horsetails whisk ferns Gymnosperms Naked Seed Plants Characteristics Possess vascular tissue produce seeds that are not enclosed in an ovary have pollen for wind dispersal Examples Conifers cycads ginkgoes Angiosperms Flowering Plants Characteristics Possess vascular tissue produce flowers have fruits that enclose seeds often rely on animals for pollination Examples All flowering plants including grasses trees shrubs and wildflowers II The Evolution of Vascular Tissue A Key Innovation A What are the two main types of vascular tissue Xylem Transports water and dissolved minerals upward from the roots to the rest of the plant Phloem Transports sugars produced during photosynthesis from the leaves to other parts of the plant B What are the advantages of vascular tissue Increased Height Vascular tissue allows plants to grow taller providing access to more sunlight Efficient Nutrient Transport Allows for the efficient transport of water minerals and sugars throughout the plant Colonization of Dry Habitats Efficient water transport enables plants to survive in drier environments C Which groups of plants have vascular tissue Pteridophytes Seedless Vascular Plants Ferns horsetails whisk ferns Gymnosperms Naked Seed Plants Conifers cycads ginkgoes Angiosperms Flowering Plants All flowering plants III The Evolution of Seeds A Further Adaptation 3 A What is a seed and what are its advantages Seed A structure that contains a plant embryo a food supply endosperm and a protective coat Advantages Protection The seed coat protects the embryo from desiccation mechanical damage and pathogens Dormancy Seeds can remain dormant until favorable conditions exist for germination Dispersal Seeds can be dispersed by wind water or animals allowing the plant to colonize new areas Food Supply The endosperm provides nutrients for the developing embryo allowing it to survive until it can photosynthesize on its own B Which groups of plants produce seeds Gymnosperms Naked Seed Plants Conifers cycads ginkgoes Angiosperms Flowering Plants All flowering plants IV The Evolution of Flowers and Fruits The Key to Angiosperm Success A What are the key features of flowers Sepals Protect the flower bud before it opens Petals Often brightly colored and fragrant to attract pollinators Stamens Produce pollen which contains the male

gametes Pistil Contains the ovary which houses the ovules female gametes B What is the role of fruits in angiosperm reproduction Fruits Develop from the ovary after fertilization and typically enclose the seeds Role Help disperse seeds by attracting animals through fleshy fruits or by being dispersed by wind or water dry fruits C What are the advantages of flowers and fruits for angiosperms Increased Pollination Efficiency Flowers attract pollinators which increase the likelihood of fertilization Seed Dispersal Fruits aid in seed dispersal allowing angiosperms to colonize new areas Coevolution with Animals The development of flowers and fruits has led to coevolutionary relationships with animals benefiting both parties V Adaptations for Life on Land A Summary 4 A Summarize the key adaptations that enabled plants to colonize land Vascular Tissue Allowed for efficient transport of water and nutrients Seeds Provided protection dormancy and dispersal for embryos Flowers and Fruits Increased pollination efficiency and facilitated seed dispersal Cuticle A waxy covering that helps prevent water loss Stomata Pores on leaves that allow for gas exchange B What are the major trends in plant evolution and what are the implications of these trends Increased Complexity Plants have evolved from simple nonvascular bryophytes to complex vascular plants with seeds flowers and fruits Diversification The plant kingdom has diversified into a wide range of species adapted to diverse environments Coevolution Plants have coevolved with animals leading to mutualistic relationships that have driven plant evolution Conclusion The colonization of land by plants was a major evolutionary event that has had a profound impact on the biosphere Through a series of key adaptations plants have become the dominant life forms on Earth providing oxygen food and habitat for countless other organisms Understanding the evolution of plants provides insights into the remarkable diversity of life on Earth and highlights the importance of adaptation and coevolution in driving the evolution of species

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