

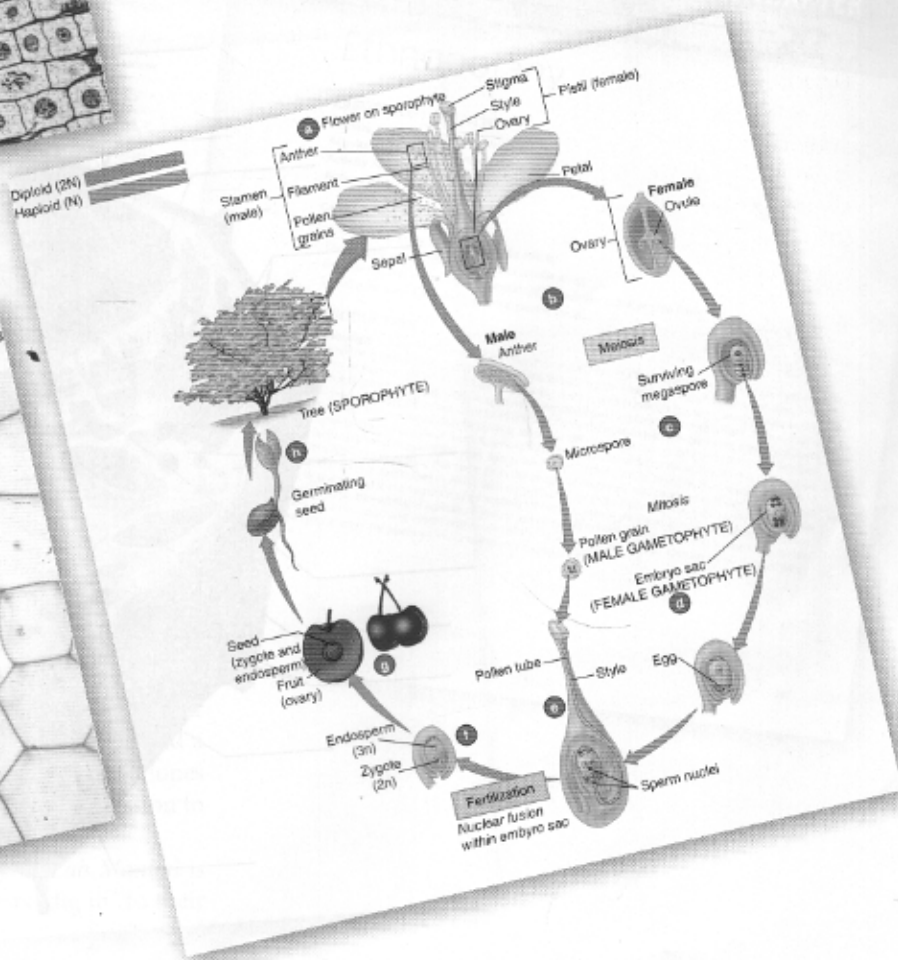
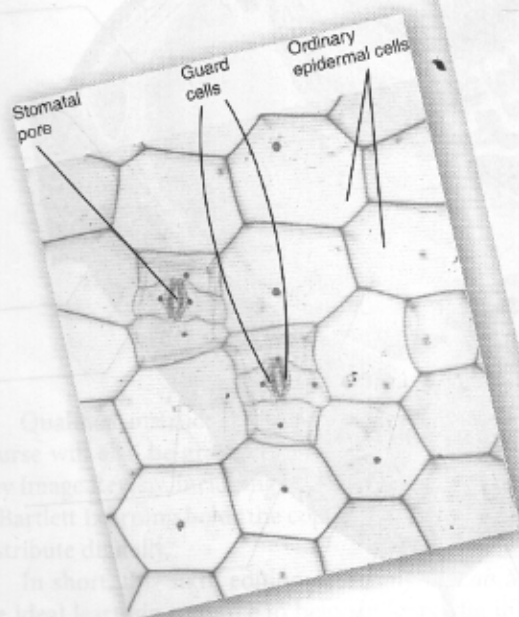
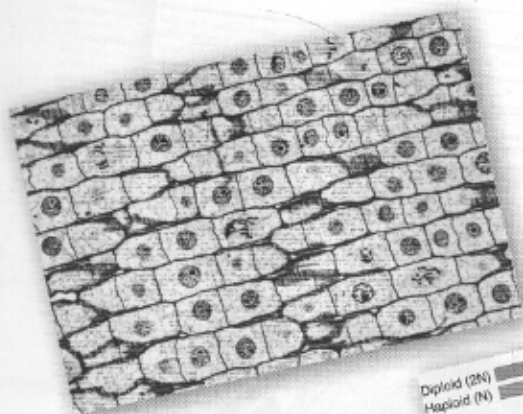
PREFACE

Botany is a hands-on science. In order to fully absorb the material, students need to get out there and get their hands dirty, often literally. As with any scientific study, it is vital to observe and experiment, so laboratory activities are crucial to a complete learning experience.

Our core plant biology book, *Botany: An Introduction to Plant Biology*, by James D. Mauseth, has just undergone a major revision. With significant improvements to the art, design, pedagogy, and content, we have created a learning resource of the highest quality for our instructors and students in introductory botanical science courses. Naturally, a

book of this quality deserves a lab manual of equal quality and usefulness, and this overhaul reflects that. Numerous significant improvements have been made, all with instructors and students in mind.

The first obvious improvement is that this resource is printed in full color. We experience the plant world in color, so this lab manual, as a guide to exploration of the plant world, will best reflect that with clear micrographs, detailed and realistic illustrations, bright photographs, and a new, engaging color design. What students see in the lab manual will be much closer to what they see in their experiments and under their microscopes.



Second, we have selected a spiral binding. Most students will be reading and writing in this book in a laboratory setting, and that will be much easier now that the pages can lay flat on their lab benches. Perforated pages will simplify assignments

for instructors and students as they are now able to easily tear out their work and submit it for a grade. Furthermore, the areas for responses and sketching have been more clearly defined with boxes and lines to improve organization.

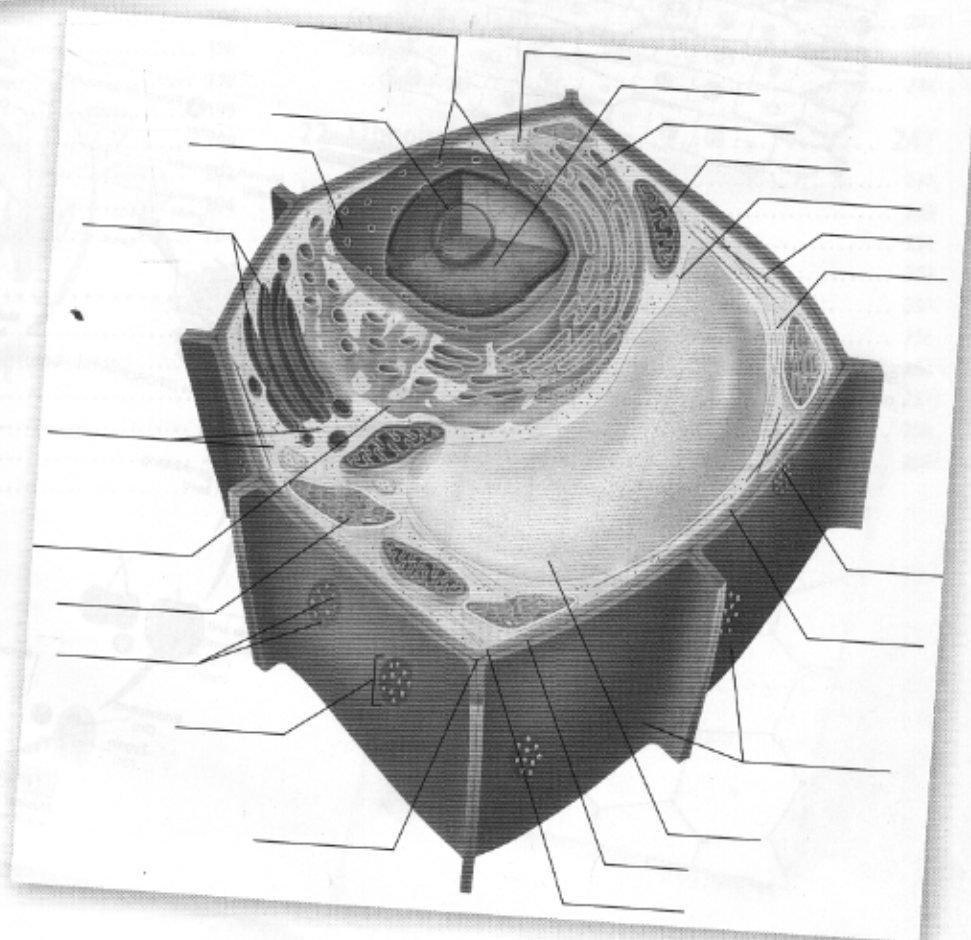
CASE STUDY—The Hot Lawn

Alexandria has a lovely front lawn that she enjoys tending every weekend. One day, while the temperature is especially warm, she goes outside to relax on her patio and enjoy the weather. She notices that the blades of grass in her lawn seem to be curled inward toward the stem and worries that there might be something wrong. She calls her landscaper who assures her that the condition of the grass is completely normal.

1. What type of plant is grass? Is it a monocot or a eudicot? How can you tell?

2. What types of cells are present in the blades of grass to cause them to curl inward toward the stem?

3. Why did this reaction occur? How does it benefit the plant?



New Case Studies have been added to every chapter. These provide students with a scenario related to the chapter and are followed up with questions that require critical thinking and knowledge application. This concept application is also helpful for situations where a lab may not be

equipped to perform certain exercises or if instructors don't have room in their course to assign all of the practical activities. In addition, several image labeling exercises have been incorporated in select chapters as well as two new chapters on Community Ecology and Ethnobotany.



CHAPTER 21

Community Interactions

LABORATORY ACTIVITIES

Activity 21.1: Plant Diversity Survey

GOALS

- Following this exercise, students should be able to:
 - Understand the importance of studying community ecology.
 - Understand the different ways that species and communities can interact with one another.
 - Understand the trophic levels of the food chain.

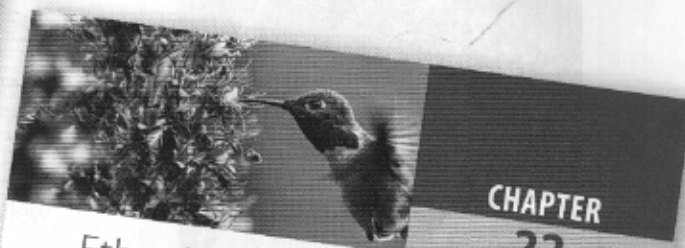
INTRODUCTION

A **community** is a group of species that occur together at the same time and place. The study of **community ecology** examines how each species interacts with and affects other species within the same community. A community is a result of different species interacting with one another by different means. If two species are each other, they are both dependent on the same limited supply of resources and will seek to exclude each other. In **mutualism**, both species interactions are beneficial to each other. In **commensalism**, one species benefits whereas the other is harmed. A **food chain** is a relationship in which one species is able to create their own food through photosynthesis. These producers are the **primary producers**, or **feeding** relationships between predator and prey. At the base of each food chain are the **primary producers**, who are able to create their own food through photosynthesis. These producers are the **primary producers**, who are **consumers**. All of these potential interactions must be taken into consideration when studying community ecology.

Communities have boundaries both spatially and temporally. Spatially, a community can only reach as far as the **habitat** remains suitable or until an impassable geographic barrier is reached. The **habitat** is the set of conditions in which an organism competes at its life cycle. Habitat is composed of both **biotic** (living) and **abiotic** (nonliving) components. Temporally, communities have a life span; they are formed and remain for a period of time before conditions eventually change and they come to exist. As they age, many communities undergo a predictable sequence of changes called **succession** (Figure 21-1). Succession occurs because each member of the community alters its habitat in a way that benefits other organisms more than itself. The end result of succession is a **stable climax community** that can persist for long periods of time.

A new community can be formed after a **disturbance** such as a fire, landslide, avalanche, or flooding causes a rapid change in an ecosystem. A pond community, for example, might begin its existence when a family of beaver builds a dam across a fast-flowing stream. The beaver dam impedes the flow of the stream and a wide,

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CHAPTER 22

Ethnobotany

LABORATORY ACTIVITIES

Activity 22.1: Plants That Provide Drugs

Activity 22.2: Plants That Supply Fibers

Activity 22.3: Spices and Flavors

Activity 22.4: Daily Use

GOALS

- Following this exercise, students should be able to:
 - Describe the uses of different plants that provide drugs.
 - Describe the uses and processing methods of different plants that provide fibers.
 - Describe the uses of different plants that provide spices.

INTRODUCTION

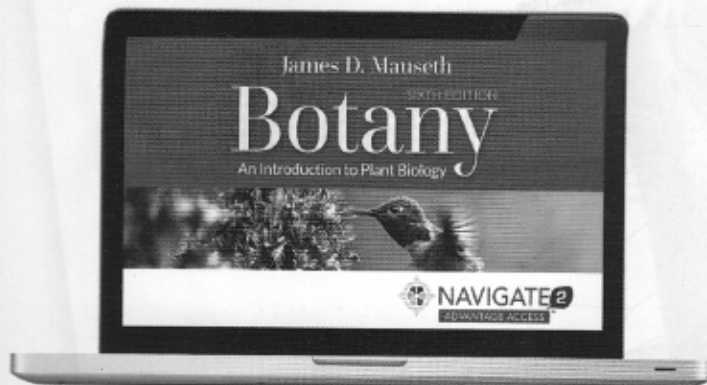
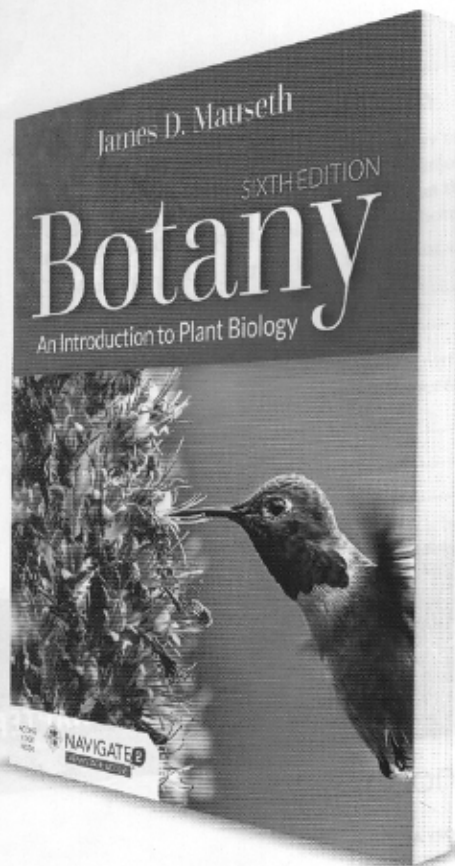
Ethnobotany is the scientific study of the relationships between plants and people. An ice age covered much of the northern hemisphere in permafrost and glaciers during the Pleistocene epoch while some areas of the southern hemisphere remained unglaciated. During this period, the human population was small and nomadic, hunting and gathering berries, seeds, and flowers. People began to cultivate and domesticate crops as early as 11,000 years ago after the ice age came to an end and the earth began to warm. Interestingly, agriculture seems to have been independently discovered in at least four different locations on different continents. Potatoes, corn, and beans were domesticated in the Americas, wheat and rice in the Near East, and cotton in western Afghanistan. Around 9,000 years ago in the Fertile Crescent, which stretches from southern Turkey to the Nile, the first domesticated crops were wheat and rice. The people of southern Asia began to cultivate rice, and people in the Near East began to domesticate wheat. The domestication of crops led to the development of agriculture, which led to the development of permanent settlements. People rely on plants not only for food, but also for medicine, spices, fiber, ornamentation, and overall enrichment of life. As you complete this lab exercise, try to think of other examples of ways that plants are important in your everyday life.

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Qualified instructors who use the lab manual in their course will also be granted access to an Answer Key and a Key Image Review, including all of the images to which Jones & Bartlett Learning holds the copyright or has permission to distribute digitally.

In short, this sixth edition of *Botany: A Lab Manual* is the ideal learning resource to help students "dig in" to their study of botany.

BUNDLE AND SAVE ON BOTANY: AN INTRODUCTION TO PLANT BIOLOGY



Botany: An Introduction to Plant Biology, Sixth Edition continues to set the standard for the fundamentals of plant science. No botany text better connects structure to function and does so with higher quality art and imagery. Combining strong scientific grounding with an approachable writing style, *Botany: An Introduction to Plant Biology, Sixth Edition* teaches and engages. The essentials to a foundational understanding of plant science are all here, including structure, genetics and evolution, physiology and development, and ecology. Print book with Navigate 2 Advantage Access: 978-1-284-07753-7 Print book with Navigate 2 Advantage Access with Lab Manual: 978-1-284-11819-3

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