

Preface

This laboratory manual assumes no previous knowledge of the biological sciences on the part of the student. It is designed for use in a one-semester or one-quarter introductory course in plant biology and shorter introductory botany courses open to both nonmajors and majors.

Both the principles of biology and the scientific method are introduced, using plants as illustrations. The first few laboratory exercises include introductions to such topics as the microscope, cells, mitosis, roots, stems, and leaves. An exercise on plant propagation, in which students make their own cuttings and grafts, is provided. A functional approach to the topics of cell components and products, diffusion, growth regulation, photosynthesis, and respiration is employed. Exploration of algae, fungi, lichens, bryophytes, ferns, conifers, flowering plants, ecology, and genetics provides students with an understanding of the diversity and complexity of organisms presented in this laboratory manual. Displays of spices, survival plants, and fruit types are suggested. Keys to conifers and woody flowering plants in both their active and dormant conditions are furnished. Each exercise is a unit in itself, allowing for considerable flexibility in sequence of presentation.

If an instructor wishes to use all of the exercises during one semester or quarter, some sessions may include two exercises within the time allotted (e.g., Exercises 2 and 3; Exercises 5 and 6; Exercises 8 and 9, etc.) See the *Instructor's Manual* that accompanies the text (Kingsley R. Stern, *Introductory Plant Biology*, tenth edition; Dubuque, Iowa: McGraw-Hill Publishers, 2006), for additional alternatives. Materials needed are listed at the beginning of each exercise, and formulae for preparing solutions are listed at the back of the laboratory manual. Suggestions and sources for motion pictures, videotapes, and other visual aids are provided in the *Instructor's Manual*.

Because students observe organisms and structures more closely when they are asked to draw them, some suggestions for student drawings are given at the ends of the exercises. In some instances, however, the drawing of an object can become more of a "busy work" exercise than a constructive educational experience. Accordingly, drawings

of certain selected organisms and structures are provided for the students to label. Experience suggests this compromise is appropriate for introductory biology laboratory exercises.

The manual is designed so that students can work more or less independently. Instructors are free to require different drawings or other assignments and may also omit some of those suggested within each exercise.

Students are encouraged to read the laboratory exercise before coming to class. To assist them to this end, laboratory preparation quizzes are provided at the end of each exercise. These quizzes should be assigned during the previous laboratory session and collected at the beginning of the class the following week. Answers to the questions are discernible within the particular exercises and should not require checking other sources. In addition, each exercise includes some suggested learning goals and exercise review questions.

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