

AP Biology Lab 7

GENETICS OF ORGANISMS

OVERVIEW

In this lab you will use living organisms to do genetic crosses. You will learn how to collect and manipulate the organisms, collect data from F_1 and F_2 generations, and analyze the results from a monohybrid, dihybrid or sex-linked cross. The procedures that follow apply to fruit flies.

OBJECTIVES

Before doing this lab you should understand:

- Chi-square analysis of data, and
- the life cycle of diploid organisms useful in genetic studies.

After doing this lab you should be able to:

- investigate the independent assortment of two genes and determine whether the two genes are autosomal or sex-linked using a multigenerational experiment, and
- analyze the data from your genetic crosses using chi-square analysis techniques.

INTRODUCTION

Drosophila melanogaster, the fruit fly, is an excellent organism for genetics studies because it has simple food requirements, occupies little space, is handy, completes its life cycle in about 12 days at room temperature, produces large amounts of off spring, can be immobilized readily for examination and sorting, and has many types of hereditary variations that can be observed with low-power magnification. *Drosophila* has a small number of chromosomes (four pairs). These chromosomes are easily located in the salivary gland cells. *Drosophila* exists in stock cultures that can be readily obtained from several sources. Much research about the genetics of *Drosophila* during the last 50 years has resulted in a wealth of reference literature and a knowledge about hundreds of its genes.

The Life Cycle of *Drosophila*

The Eggs. The eggs are small, oval shaped, and have two filaments at one end. They are usually laid on the surface of the culture medium and, with practice, can be seen with the naked eye. The eggs hatch into larvae after about one day.

The Larval Stage. The wormlike larvae eats almost continuously, and its black mouth parts can easily be seen moving back and forth even when the larva itself is less distinct. Larvae tunnel through the culture medium while eating; thus, channels are a good indication of the successful growth of a culture. The larva sheds its skin twice as it increases in size. In the last three larval stages, the cells of the salivary glands contain giant chromosomes, which may be seen readily under low-power magnification after proper staining.

The Pupal Stage. When a mature larva in a lab culture is about to become a pupa, it usually climbs up the side of a culture bottle or onto the strip provided in the culture bottle. The last larval covering then becomes harder and darker, forming the pupal case. Through this case the later stages of metamorphosis to an adult fly can be observed. In particular, the eyes, the wings, and the legs become readily visible.

Lab Seven Genetics Of Organisms Teacher Guide

Tao Wei



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Resources for Teaching Middle School Science Smithsonian Institution, National Academy of Engineering, National Science Resources Center of the National Academy of Sciences, Institute of Medicine, 1998-04-30 With age appropriate inquiry centered curriculum materials and sound teaching practices middle school science can capture the interest and energy of adolescent students and expand their understanding of the world around them *Resources for Teaching Middle School Science* developed by the National Science Resources Center NSRC is a valuable tool for identifying and selecting effective science curriculum materials that will engage students in grades 6 through 8 The volume describes more than 400 curriculum titles that are aligned with the National Science Education Standards This completely new guide follows on the success of *Resources for Teaching Elementary School Science* the first in the NSRC series of annotated guides to hands on inquiry centered curriculum materials and other resources for science teachers The curriculum materials in the new guide are grouped in five chapters by scientific area Physical Science Life Science Environmental Science Earth and Space Science and Multidisciplinary and Applied Science They are also grouped by type core materials supplementary units and science activity books Each annotation of curriculum material includes a recommended grade level a description of the activities involved and of what students can be expected to learn a list of accompanying materials a reading level and ordering information The curriculum materials included in this book were selected by panels of teachers and scientists using evaluation criteria developed for the guide The criteria reflect and incorporate goals and principles of the National Science Education Standards The annotations designate the specific content standards on which these curriculum pieces focus In addition to the curriculum chapters the guide contains six chapters of diverse resources that are directly relevant to middle school science Among these is a chapter on educational software and multimedia programs chapters on books about science and teaching directories and guides to science trade books and periodicals for teachers and students Another section features institutional resources One chapter lists about 600 science centers museums and zoos where teachers can take middle school students for interactive science experiences Another chapter describes nearly 140 professional associations and U S government agencies that offer resources and assistance Authoritative extensive and thoroughly indexed and the only guide of its kind *Resources for Teaching Middle School Science* will be the most used book on the shelf for science teachers school administrators teacher trainers science curriculum specialists advocates of hands on science teaching and concerned parents

Teaching Science in the Block Alvin Pettus, Myron Blosser, 2014-01-09 This book provides detailed instructional strategies sample lesson plans and sample assessments to help science teachers make the best use of the additional time available in a block schedule

Teacher's Wraparound Edition: Two Biology Everyday Experience Albert Kaskel, 1994-04-19 *Biology*, 1999 *The American Biology Teacher*, 2007-08 **Argument-driven Inquiry in Biology** Victor Sampson, 2014-04-01 Are you interested in using argument driven inquiry for high school lab instruction but

just aren't sure how to do it You aren't alone This book will provide you with both the information and instructional materials you need to start using this method right away Argument Driven Inquiry in Biology is a one stop source of expertise advice and investigations The book is broken into two basic parts 1 An introduction to the stages of argument driven inquiry from question identification data analysis and argument development and evaluation to double blind peer review and report revision 2 A well organized series of 27 field tested labs that cover molecules and organisms ecosystems heredity and biological evolution The investigations are designed to be more authentic scientific experiences than traditional laboratory activities They give your students an opportunity to design their own methods develop models collect and analyze data generate arguments and critique claims and evidence Because the authors are veteran teachers they designed Argument Driven Inquiry in Biology to be easy to use and aligned with today's standards The labs include reproducible student pages and teacher notes The investigations will help your students learn the core ideas crosscutting concepts and scientific practices found in the Next Generation Science Standards In addition they offer ways for students to develop the disciplinary skills outlined in the Common Core State Standards Many of today's teachers like you want to find new ways to engage students in scientific practices and help students learn more from lab activities Argument Driven Inquiry in Biology does all of this even as it gives students the chance to practice reading writing speaking and using math in the context of science

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explores its use across the gamut of biological model systems As the subject has risen from a significant new discovery to a mainstream molecular biology practice it is essential that students of molecular biology understand the fundamentals behind CRISPR Cas9 technology and how it may be employed efficiently and ethically in research This volume edited by experts in both molecular biology and undergraduate education will teach not only the fundamentals of using CRISPR Cas9 but also how to successfully employ this technology in classroom settings The book is written for undergraduates and advanced high school classes in the area of molecular biology genetics genomics and biological engineering and will provide a perfect tool for undergraduate lecturers to prepare their classes

Selected Water Resources Abstracts ,1991 **BSCS Biology** ,1997 **Recombinant DNA Technical Bulletin** ,1984 **Management of Microbial Resources in the Environment** Abdul Malik, Elisabeth Grohmann, Madalena Alves, 2013-02-26 This volume details the exploration collection characterization evaluation and conservation of microbes for sustainable utilization in the development of the global as well as national economies e g in agriculture ecosystems environments industry and medicine Many research institutes and universities all over the world carry out microbiological and biotechnological research which generates substantial genomic resources such as cDNA libraries gene constructs promoter regions transgenes and more valuable assets for gene discovery and transgenic product development This work provides up to date information on the management of microbial resources in the environment It also covers the ecology of microorganisms in natural and engineered environments In trying to understand microbial interactions it further focuses on genomic metagenomic and molecular advances as well as on microbial diversity and phylogeny ecological studies of human animal and plant microbiology and disease microbial processes and interactions in the environment and key technological advances Though not intended to serve as an encyclopedic review of the subject the various chapters investigate both theoretical and practical aspects and provide essential basic information for future research to support continued development

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