



# GREENHOUSE MANUAL

An Introductory Guide for Educators



UNITED STATES BOTANIC GARDEN



NATIONAL CENTER FOR  
APPROPRIATE TECHNOLOGY

Across the United States, a growing number of schools and educational pro

gardens, engaging in Farm to School activities, and integrating plant science into the curriculum. To support and expand these hands-on learning activities, we have developed ways to build new infrastructure or reinvest in existing facilities such as greenhouses. Unfortunately, many school greenhouses are underutilized or only a dedicated teacher is enabling their use.

The United States Botanic Garden, the National Center for Appropriate Technology, and City Blossoms recognized the emerging need for user-friendly greenhouses and maximizing their potential. To that end, we have developed this introductory manual for educators wanting to better use new greenhouses for programming. The manual clearly and concisely lays out a basic understanding of greenhouses, how to integrate them into lessons, and how to effectively use them in classroom curricula and out-of-school activities. The manual includes lesson plans as well as basic information on layout and operations of a greenhouse, and how to manage it (during the school year), growing from seed, seedling nutrition, identifying and treating disease and pest management in greenhouses, basic budgeting, and more.

This useful resource will help facilitate transformative learning experiences in schools nationwide, while cultivating students' appreciation of the science of plants.

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**Key words:** Green house, greenhouse, hoop house, high tunnel, project based learning, Pests, lesson plans, farm to school, raised beds, passive solar greenhouse, cold frames, green house glazing, plant based curricula, Greenhouse-based Curricula, Garden-based Curricula, greenhouse/sustainable development, succession planting, germination test, soil mixes, seed starting, seedling trouble shooting, greenhouse pests and disease,

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