

Wallingford Public Schools - HIGH SCHOOL COURSE OUTLINE

Course Title: Plant Science 2	Course Number: 8343
Department: Agricultural Education	Grade(s): 10
Level(s): Academic	Credit(s): 1.5
Course Description Sophomore course work introduces students to ornamental plants, fall flower gardening, plant propagation, annuals, and vegetables and continues to build their understanding of the holiday shop in December. Students will be introduced to and participate in the Lyman Hall Chapter of the National FFA organization, FFA. Students will continue to develop their portfolio and identify skills to prepare them for future careers in plant science.	
Required Instructional Materials Sufficient Hands-on Materials	Completion/Revision Date Approved by Board of Education October 15, 2007

Mission Statement of the Curriculum Management Team

The mission of the Career and Technical Education Curriculum Management Team is to ensure that students, as a result of their experiences in K-12, will demonstrate transferable skills, knowledge, and attributes for successful life management, employment, career development, post-secondary educational opportunities, and life long learning.

Enduring Understandings for the Course

- Self-reflection of learning experiences, in and out of school, fosters the development of a life long learner. Life long learners are able to apply and refine skills as they prepare for their post-high school endeavors.
- Ornamental plants have specific qualities which make them valuable in the landscape.
- The physical geography and climate of a region influences the flora.
- The various parts of a plant have specific functions with each contributing to the plant's well-being.
- Gardeners select plants for a particular planting site based on desired characteristics.
- A florist is a multifaceted business that requires creativity, time management, and business knowledge to manage successfully.
- All organizations, including the FFA, have standardized procedures for operation to help ensure smooth and efficient meetings.
- As leadership changes occur, the standardized operational procedures aid in smooth transitions and encourage participation by all members.
- Successful preparation for the interview process and the ability to present yourself professionally will set you apart from other applicants.
- Plant reproduction may result from the exchange of genetic materials (sexual reproduction) or the formation of new individuals from the cell(s) of a single parent (asexual reproduction).

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| <ul style="list-style-type: none">• The greenhouse industry is large and diverse. |
| <ul style="list-style-type: none">• Successful production of a seasonal crop depends on applying technical skills ranging from transplanting seedlings, to marketing, pricing and customer service. |

LEARNING STRAND

1.0 Transferable Skills

ENDURING UNDERSTANDING(S)

- Self-reflection of learning experiences, in and out of school, fosters the development of a life long learner. Life long learners are able to apply and refine skills as they prepare for their post-high school endeavors.

ESSENTIAL QUESTION(S)

- What is the importance of maintaining a portfolio?
- What are the qualities of an effective oral presentation?
- What safety precautions do I have to follow?
- What can I do differently next time?
- What does a cooperative group require to function successfully?
- How can I assess the situation and implement change?
- What are the characteristics of an organized person? What do I need to do to be more organized?
- How can I manage informational research, organize the information, and present it professionally?
- What is a leader?

LEARNING OBJECTIVES The students will:

- 1.1 Demonstrate public speaking skills using appropriate visuals and tailoring the presentation to specific audiences.
- 1.2 Communicate in writing about a topic using different formats applying relevant vocabulary, supporting evidence and clear logic.
- 1.3 Self-assess transferable skills and reflect on areas of strengths and improvement.
- 1.4 Identify and use the appropriate tools and equipment safely.
- 1.5 Work cooperatively with fellow peers, teachers, and employers to complete a task.
- 1.6 Apply problem solving skills to critically approach a situation and work through the steps to solve the problem.
- 1.7 Develop organizational skills that assist with data collection, data analysis and synthesis.
- 1.8 Apply research skills to collect information, summarize the findings and to cite the sources used.
- 1.9 Recognize leadership skills such as: motivating others, negotiating,

INSTRUCTIONAL SUPPORT MATERIALS

- See other learning strands for integration

SUGGESTED INSTRUCTIONAL STRATEGIES

- See other learning strands for integration

SUGGESTED ASSESSMENT METHODS

- See other learning strands for integration

participating in meetings, gaining confidence, and gaining self-awareness, etc.

- 1.10 Apply computer-based tools such as PowerPoint, Word, Excel, and Access, to organize and present information.
- 1.11 Demonstrate self expression and creativity through different projects.
- 1.12 Develop a positive attitude and become an independent learner in order to prepare for the future.
- 1.13 Organize and maintain a four year portfolio including a compilation of student products and reflections.
- 1.14 Document SAE (Supervised Agricultural Experience) monthly. This includes recording hours, expenses, income, tasks and applied skills.

LEARNING STRAND

- 2.0 Ornamental Plant Material
- Approximately 4 weeks

ENDURING UNDERSTANDING(S)

- Ornamental plants have specific qualities which make them valuable in the landscape.
- The physical geography and climate of a region influences the flora.

ESSENTIAL QUESTION(S)

- What characteristics make ornamental plants unique?
- How are ornamental plants classified?
- What is plant hardiness and how is this related to planting zones for a plant?
- How are plants selected for various landscape plantings?

LEARNING OBJECTIVES – The students will:

- 2.1 Classify plants into different types such as coniferous, deciduous, and evergreen.
- 2.2 Identify woody plants as trees, shrubs, vines, or groundcovers.
- 2.3 Identify vegetative characteristics of woody plants.
- 2.4 Identify a minimum of 40 landscape plants.
- 2.5 Select plants for specific uses in the landscape based on characteristics such as:
 - Size
 - Type
 - Shape
 - Seasonal interest
- 2.6 Identify plant hardiness zones in the United States.

INSTRUCTIONAL SUPPORT MATERIALS

- Assorted seeds, plants, flowers, leaves
- Common ornamental plant samples, pictures, or dried specimens
- Land lab at Lyman Hall High School

SUGGESTED INSTRUCTIONAL STRATEGIES

- Model ways to identify specific characteristics of ornamental plants using different plant samples
- Use reference books and field notes to complete identification sheets
- Collect plant material to press as part of identification sheets
- Field trips to various sites for observation and collecting

SUGGESTED ASSESSMENT METHODS

- Plant identification sheets with pressed samples
- Letter of recommendation to a client regarding a suggested seasonal landscape planting
- Plant zone map activity
- Quizzes and test
- Portfolio may include:
 - Skill sheet
 - Letter to client
 - Picture of leaf collection

LEARNING STRAND

3.0 Fall Flower Gardening

- Approximately 4 weeks

ENDURING UNDERSTANDING(S)

- The various parts of a plant have specific functions with each contributing to the plant's well-being.
- Gardeners select plants for a particular planting site based on desired characteristics.

ESSENTIAL QUESTION(S)

- How are plants and their parts alike and how are they different?
- When do plants exhibit seasonal changes as part of their normal growth/development cycle?
- How can different bulb gardens be used in landscape design?
- How does a designer decide what bulbs to plant and where to plant them?

LEARNING OBJECTIVES – The students will:

- 3.1 Distinguish between a fall and a spring bulb.
- 3.2 Identify bulbous parts including:
 - True bulb
 - Rhizome
 - Tuber
 - Corm
- 3.3 Identify the parts and function of each bulbous part.
- 3.4 Identify common spring and fall bulbs.
- 3.5 Design bulb planting gardens for specific requirements including:
 - Rock garden (early)
 - Massing
 - Succession (March – June)
 - Summer patio
- 3.6 Design and plant a fall bulb planting
 - Planting techniques
 - Bulb planting tools

INSTRUCTIONAL SUPPORT MATERIALS

- Bulb catalogs
- Bulb planting tools
- Drawing templates
- Common bulb plant samples, pictures, or dried specimens
- Assorted reference books and magazines
- Assorted bulbs

SUGGESTED INSTRUCTIONAL STRATEGIES

- Field trip to local nursery
- Vocabulary reinforcement activities
- Dissecting bulbous parts
- Drawing garden designs
 - Demonstrate use of template and color rendering techniques
 - Orientation of symbols
 - Model sketching techniques
- Use catalogs to create a price list to accompany bulb planting
- Model how to create an identification card including:
 - Common name and scientific name
 - Identify characteristics such as color, height, planting season, bloom season, planting depth, other comments
 - Picture of bulb
- Model bulb planting techniques
- Write a justification for a bulb planting

SUGGESTED ASSESSMENT METHODS

- Identification cards

- Quizzes
- Written justification for one of the bulb plantings
- Critique of classmates planting plan
- In spring revisit fall gardens and critique success of plantings
- Portfolio may include:
 - Skill sheet
 - Planting plans
 - Written justification for planting plan

<u>LEARNING STRAND</u>	
4.0 Holiday Shop <ul style="list-style-type: none"> Approximately 4 weeks - December 	
<u>ENDURING UNDERSTANDING(S)</u> <ul style="list-style-type: none"> A florist is a multifaceted business that requires creativity, time management, and business knowledge to manage successfully. 	<u>ESSENTIAL QUESTION(S)</u> <ul style="list-style-type: none"> What are the components of a pleasing arrangement? What makes an arrangement salable? What personal attributes are necessary for success in the floral business? What does a florist consider when managing seasonal sales? What is professional? (behavior, merchandise)
<u>LEARNING OBJECTIVES</u> – The students will: 4.1 Demonstrate merchandising skills such as: <ul style="list-style-type: none"> Attach wire hangers on wreaths Determine the wreath sizes Attach a tag with the wreath size to individual wreaths Green and design variety of boxwood and seasonal green arrangements Prepare plants for holiday sale Establish price and create a sales tag for saleable merchandise 4.2 Demonstrate basic customer service skills such as: <ul style="list-style-type: none"> Foil holiday plants Sleeve and/or wrap plants and arrangements for delivery Assist customers with sales Complete customer order forms Locate merchandise and/or orders for customers Complete sale Assist with daily organization of wreath and plant orders 	<u>INSTRUCTIONAL SUPPORT MATERIALS</u> <ul style="list-style-type: none"> Assorted wire, tags, wreaths, ribbon, pots and potting material, holiday embellishments, seasonal floral decorations Holiday plants and greenery Seasonal cut flowers and mixed seasonal greens <u>SUGGESTED INSTRUCTIONAL STRATEGIES</u> <ul style="list-style-type: none"> Prepare and manage the Holiday Shop for the community Use pictures and materials to model different floral design principles such as focal point, rhythm, balance Demonstrate method for attaching wire hangers, wreath sizing, and attaching tags Design and construct a wreath Model basic flower design skills when creating boxwood rings and/or holiday arrangements Review and discuss student expectations during the Holiday Shop Discuss how the Holiday Shop differs from other classes and is open to the public <u>SUGGESTED ASSESSMENT METHODS</u> <ul style="list-style-type: none"> Teacher observation Daily log Individual student work samples with written critique Holiday Shop written review – personal

assessment and critique of the Holiday Shop

- Portfolio may include:
 - Unit skill sheet
 - Photo of products completed including price and description
 - Log of daily activities
 - Holiday Shop written review – personal assessment and critique of the Holiday Shop

<u>LEARNING STRAND</u>	
<p>5.0 FFA Leadership - Chapter Degree</p> <ul style="list-style-type: none"> Approximately 2 weeks 	
<p><u>ENDURING UNDERSTANDING(S)</u></p> <ul style="list-style-type: none"> All organizations, including the FFA, have standardized procedures for operation to help ensure smooth and efficient meetings. As leadership changes occur, the standardized operational procedures aid in smooth transitions and encourage participation by all members. 	<p><u>ESSENTIAL QUESTION(S)</u></p> <ul style="list-style-type: none"> What are the operational procedures that civic organizations utilize? How are official meetings conducted? What is the rationale for conducting parliamentary correct meetings? What are the qualities of an effective oral presentation?
<p><u>LEARNING OBJECTIVES</u> – The students will:</p> <p>5.1 Meet the criteria for the FFA Chapter Degree. This includes:</p> <ul style="list-style-type: none"> Demonstrate basic parliamentary abilities. Demonstrate five parliamentary procedures in a mock meeting format. Deliver a 15 minute oral presentation on an agricultural topic. Other SAE minimum requirements. 	<p><u>INSTRUCTIONAL SUPPORT MATERIALS</u></p> <ul style="list-style-type: none"> FFA manual www.ffa.org Paraphernalia such as gavel, officer symbols, jacket, Robert’s Rules of Order, Etc. <p><u>SUGGESTED INSTRUCTIONAL STRATEGIES</u></p> <ul style="list-style-type: none"> Complete application for the Chapter Degree Discuss organizations such as the BOE, wetlands, parliament and other commissions who also use parliamentary procedure. Create a PowerPoint presentation or design a tri-fold board as a visual aid for the oral presentation Create an informational hand-out to aid the oral presentation Conduct mock meetings and experience different roles (president, secretary, members, etc) during mock meetings Type a script to simulate the meeting Discuss effective oral presentation skills Discuss how to create an outline for an oral presentation <p><u>SUGGESTED ASSESSMENT METHODS</u></p> <ul style="list-style-type: none"> Score 80% or higher on the FFA unit test Meet criteria for Chapter Degree and complete written application Rubric for oral presentation Portfolio products many include: <ul style="list-style-type: none"> Skill Sheet

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| | <ul style="list-style-type: none">• Samples of visual aide from presentation (photo of tri-fold board or PowerPoint)• Writing sample –script of meeting• Outline of oral presentation• Informational hand-out |
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LEARNING STRAND

6.0 School to Career Preparation – Applying for a Job

- Approximately 2 weeks

ENDURING UNDERSTANDING(S)

- Successful preparation for employment and the ability to present yourself professionally will set you apart from other applicants.

ESSENTIAL QUESTION(S)

- How should you prepare and apply for employment?
- What can non-verbal communication tell a future employer about you?

LEARNING OBJECTIVES – The students will:

6.1 Prepare to apply for an entry level position.

This may include:

- Compare and contrast the differences between a job and a career
- Compile personal information that will aid in accurately completing a job application
- Identify and locate potential employment opportunities
- Complete a mock job application accurately to emphasize your positive attributes
- Identify the procedures for securing working papers and explain why/when they are required
- Explain how to professionally request, secure, and thank a person for a letter of recommendation
- Demonstrate professional phone skills when seeking employment
- Explain how to impress a potential employer through non-verbal communication skills
- Identify employer expectations such as effective working habits and discuss how to emphasize these characteristics when preparing to secure employment

Note:

Employment and other related experiences outside of the classroom can be applied towards the SAE requirements.

INSTRUCTIONAL SUPPORT MATERIALS

- Videos on preparing for jobs by Creative Educational Videos
- Personal information form
- Mock job application
- Newspapers, trade journals and magazines
- www.monster.com
- www.ctcareerbuilder.com
- *Choices* software program
- Phones

SUGGESTED INSTRUCTIONAL STRATEGIES

- Guest speakers:
 - Human resources representative to discuss employer expectations
 - School employee who oversees the working papers procedures
 - Guidance counselor to discuss career, job and post secondary preparation
- Job shadowing and/or interning
- Utilize *Choices* program to complete interest surveys, etc.
- Role model professional phone skills
- Write a phone script for requesting an application
- Model and role play professional non-verbal communication skills
- Write a request asking for a letter of recommendation
- Write a business letter to thank someone for a letter of recommendation
- Discuss differences between job and career
- Use standardized form to collect personal information
- Use newspaper, trade magazines and Internet to locate sources that list potential jobs

- Model how to accurately complete a job application and troubleshoot potential errors or omissions

SUGGESTED ASSESSMENT METHODS

- Portfolio products may include:
 - Skill sheet
 - Personal information form
 - Completed job application
 - Letter of recommendation
 - Letter asking for recommendation
 - Thank you letter for recommendation
 - Surveys collected from *Choices* program

LEARNING STRAND

7.0 Plant Propagation

- Approximately 4 weeks

ENDURING UNDERSTANDING(S)

- Plant reproduction may result from the exchange of genetic materials (sexual reproduction) or the formation of new individuals from the cell(s) of a single parent (asexual reproduction).

ESSENTIAL QUESTION(S)

- How do plants reproduce?
- What environmental conditions help or hinder seed reproduction?
- What are the advantages and/or disadvantages to sexual vs. asexual plant propagation?
- What is the impact on genetic engineering of plants?

LEARNING OBJECTIVES – The students will:

- 7.1 Differentiate between sexual and asexual plant propagation.
- 7.2 Identify parts, their function and processes of a flower.
- 7.3 Diagram and explain how a seed is produced.
- 7.4 Diagram and explain the process of seed germination.
- 7.5 Analyze environmental effects on seed germination.
- 7.6 Perform methods of asexual plant propagation, including:
 - Division
 - Air layering
 - Layering
 - Grafting
 - Stem, root, leaf cuttings.
- 7.7 Identify types of grafts and demonstrate grafting techniques:
 - T-Bud
 - Whip
 - Cleft
- 7.8 Compare and contrast micro-propagation techniques.

INSTRUCTIONAL SUPPORT MATERIALS

- Seeds and plant material
- Grafting knives, rubber bands, wax
- Rooting media
- Rooting hormone
- Flats, pots

SUGGESTED INSTRUCTIONAL STRATEGIES

- Seed Scarification lab
- Activities to reinforce terminology / vocabulary
- Demonstrate propagation techniques
- Mediate a discussion on plant cloning and plant genetic engineering (GE)
- Research and report on a micro-propagation technique

SUGGESTED ASSESSMENT METHODS

- Results of seed scarification lab
- Quizzes
- Success of plant propagation techniques
- Portfolio may include:
 - Unit skill sheet
 - Seed scarification lab
 - Response paper from GE discussion

LEARNING STRAND

8.0 Annuals and Vegetables

ENDURING UNDERSTANDING(S)

- The greenhouse industry is large and diverse.
- Successful production of a seasonal crop depends on applying technical skills ranging from transplanting seedlings, to marketing, pricing and customer service.

ESSENTIAL QUESTION(S)

- How are plants classified?
- What is necessary to successfully grow and raise seasonal spring plants?
- What changes must growers be aware of when marketing plants?

LEARNING OBJECTIVES – The students will:

- 8.1 Distinguish between an annual, perennial, biennial.
- 8.2 Identify common annual bedding plants.
- 8.3 Determine cultural requirements of bedding plants.
- 8.4 Identify growing containers, pots, flats, etc. used in producing bedding plants
- 8.5 Identify techniques for successful transplanting of plugs and seedlings.
- 8.6 List the components in soilless mixes.
- 8.7 Identify common greenhouse pests and institute appropriate control measures.
- 8.8 Design a flyer for the spring sale.
- 8.9 Design informational and pricing signs for crops on specific benches.
- 8.10 Evaluate MSDS sheets.

INSTRUCTIONAL SUPPORT MATERIALS

- Plugs, seeds, cuttings and seedlings
- Soil, pots, containers, flats, labels, soilless mixes, etc.
- Common annual and vegetable samples, pictures, or dried specimens

SUGGESTED INSTRUCTIONAL STRATEGIES

- Students raise a bench(s) of annuals and/or vegetables
- Field trips to local greenhouses
- Design signage for crops on bench
- Design a flyer for spring greenhouse sale
- Model how to transplant seedlings and plugs
- Decipher information on MSDS sheets
- Use common samples to identify common greenhouse pests

SUGGESTED ASSESSMENT METHODS

- Daily greenhouse log
- Identification quizzes
- Design a “Fandex” for insect ID and controls
- Portfolio may include:
 - Skill sheet
 - Fandex
 - Samples of signs and flyers