# Black Horse Pike Regional School District Curriculum Template

ENGAGING STUDENTS ● FOSTERING ACHIEVEMENT ● CULTIVATING 21ST CENTURY GLOBAL SKILLS

## Unit 1: Introduction to the Greenhouse and Careers in Horticulture

## PART I: UNIT RATIONALE

**WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

| | |
|---|---|
| **Course/Unit Title:**<br>**Horticulture/ Introduction to the Greenhouse and Careers in Horticulture** | **Unit Summary**:<br>This is the first unit that will be taught in the horticulture course. The unit will focus on careers in the horticulture field, tools used in the horticulture field and safety guidelines. The material learned in this unit will connect to every unit throughout this course.<br>The unit will start with a focus on careers in horticulture. Students will get research different careers in the field and present their findings to the class. The focus will then shift to the tools used in the field and safety measures that need to be followed in the workplace. The purpose of this unit is to give students an insight as to what a future in horticulture could look like for them outside of just starting their own garden. |
| **Grade Level(s):**<br>11th & 12th | |

| | |
|---|---|
| **Essential Question(s):**<br><br>1. How does the greenhouse work?<br>2. What future careers involve the skills learned in horticulture class?<br>3. What tools should you be familiar with if you choose a career in horticulture?<br>4. What precautions should be taken to ensure safety in the greenhouse? | **Enduring Understanding(s):**<br><br>1. The greenhouse is a controlled environment that is regulated to produce the best possible growth conditions for plant production. The factors that need to be monitored in the greenhouse include temperature, humidity, soil moisture and ventilation among others.<br>2. The skills learned in horticulture class are a good foundation for a variety of careers in a growing field. There are multiple levels of careers within the field depending on the amount of education achieved. Horticulture careers offer a wide variety of environments both indoor and outdoor and different levels of contact with the public. There is something for everyone in the field of horticulture.<br>3. There are a variety of different tools that are unique to individual tasks. It is important to use the correct tools and to properly maintain tools to ensure proper growth and prevent injury to the plant.<br>4. The greenhouse can be a dangerous place if proper safety precautions are not taken. The tools used in the greenhouse must be kept sharp and sterile. There are chemicals that can cause potential harm if ingested or if they come into contact with skin or eyes. |

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **Learning Target** | **NGSS or CCS** |
|---|---|
| 1. Describe the career fields in horticulture and the education and experience necessary to obtain a job in the field.<br><br>2. Explain how a greenhouse works.<br><br>3. Identify garden tools and their uses in landscape.<br><br>4. Apply safety practices to handle and care for the greenhouse and tools. | **1. NGSS:** HS-ESS3-3 **Other Content Areas:** WORK.9-12.9.3.12.1, WORK.9-12.9.3.12.C.2, WORK.9-12.9.3.12.C.4, WORK.9-12.9.3.12.C.8, RST.11-12.1, 2, 3, 4, 5, 6,7, WHST.11-12.1,4, 7,10<br>**2. NGSS:** HS-ESS3-3 **Other Content Areas:** WORK.9-12.9.3.12.C.3, WORK.9-12.9.3.12.1, WORK.9-12.9.3.12.C.6, WORK.9-12.9.3.12.2<br><br>**3. NGSS:** HS-ESS3-3 **Other Content Areas:** WORK.9-12.9.3.12.1, WORK.9-12.9.3.12.C.3, WORK.9-12.9.3.12.C.6, WORK.9-12.9.3.12.2, WORK.9-12.9.3.12.C.11<br><br>**4. NGSS:** HS-ESS3-3 **Other Content Areas:** WORK.9-12.9.3.12.1, WORK.9-12.9.3.12.C.3, WORK.9-12.9.3.12.C.6, WORK.9-12.9.3.12.2, WORK.9-12.9.3.12.C.11 |

**Inter-Disciplinary Connections:**

**Material presented in this section will connect with material in 21st Century Skills, and English and Language Arts. Students will be researching career options in the horticulture field, creating presentations to educate their classmates about different careers in the horticulture field and practicing and demonstrating hands on skills that are needed in the horticulture field.**

**Examples:**
**Career Project:** Students will research one career in horticulture and create a presentation to educate their classmates about the career option.
**Hands on greenhouse activities:** Students will identify tools, their uses and explain the safety procedures that must be followed when using the tools.

**Students will engage with the following text:**

***Introductory Horticulture,*** **Delmar**
**Unit 1: Section, "Exploring the Horticulture Field" (4)**

**Example**: The students will be reading the section titled, "Exploring the Horticulture Field" to introduce themselves to the various fields in horticulture. Then they will research their assigned horticulture career. While researching the students will be reading through reliable sources for information.

**Students will write:**

**In addition to warm ups, homework assignments and answers to lab follow up questions, students will engage in small group collaboration and research fields in horticulture.**

The students will be working in small groups to write 5 classroom rules they think are the most important. Then they will present their rules to the class and a discussion will follow.

The students will be researching a career in the horticulture field. They will have make a powerpoint presentation and present their information.

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

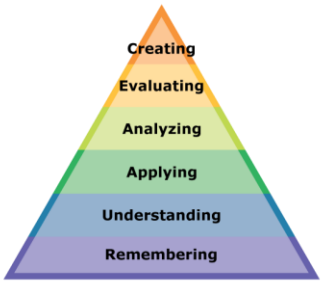
**DESCRIBE THE LEARNING EXPERIENCE.**

**<u>How</u> will students uncover content and build skills.**

- Students will be presented information in the form of multimedia presentations including Powerpoint presentations and videos.
- Students will engage the textbook to learn vocabulary, and background information about horticulture careers.
- Students will utilize computers to research careers in horticulture and present their findings.
- Students will engage in hands on activities in the greenhouse to practice proper safety precautions.
- The teacher will observe and critique student progress, provide one on one feedback and ask leading questions to assist student in thinking more critically about greenhouse operations and safety procedures.

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**<u>Formative Assessments</u>:**

**The teacher will use a variety of formal and informal formative assessments to gage student understanding. The teacher will use warm up questions, exit tickets and classwork to assess the first two levels of Bloom's on a daily basis. Projects, labs and in class group work will be assessments used to reach the middle levels of Bloom's such as applying and analyzing. The top levels of Bloom's will be assessed through essays, projects and major assessments.**

**Example Question (Applying & Analyzing):** The students will be provided pictures of multiple tools and they will have to determine a scenario of when to use them.

**<u>Accommodations/Modifications</u>:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the summative assessment during this unit are:**

- allowing for extra time on major assessments
- pictures on the test will be projected on the board so the students can easily see them

**Summative Assessments:**

**The students will complete a practicum assessment as the summative for this unit. The practicum will include all of the tools that students will use in the greenhouse and safety concerns.**

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the summative assessment during this unit are:**

- allowing for extra time on major assessments
- pictures on the test will be projected on the board so the students can easily see them
- allow students to perform the practicum outside of class hours away from an audience to decrease anxiety

**Performance Assessments:**

**Students will be required to turn in homework, participate in greenhouse activities and create a scripted demonstration based on the material in this unit.**

**Examples:**

**Career Project:** Students will research one career in horticulture and create a presentation to educate their classmates about the career option. **- Creating**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs. These may include but will not be limited to: alter grading rubric (example decrease value of spelling/grammar/punctuation for dyslexic students), work with students individually give students extra time to complete, work with students individually, assess comprehension and progress of students throughout completion of project.**

**Career Project:** Allow student to choose to work with a partner or alone, give students choice in the media used for their presentation, provide graphic organizer to assist student in organizing information, permit student to use cue cards during presentation, allow student to present after school instead of in front of peers.

## Unit 2: Pruning

## PART I: UNIT RATIONALE

**<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

| **Course/Unit Title:**<br>**Horticulture/ Pruning** | **Unit Summary**:<br><br>This unit will introduce students to pruning methods. Pruning is an essential skill for horticulture. Pruning is necessary for maintaining healthy productive plants and aesthetic value. The unit will start with an introduction to tools used for pruning. The focus will then shift to pruning methods and evaluating plants on their pruning needs. Students will also learn proper pruning technique. This unit will connect to all future units. Concepts taught in this unit will be utilized throughout the projects in the entirety of this course. |
|---|---|
| **Grade Level(s):**<br>11th & 12th | |
| **Essential Question(s):**<br><br>1. Why do plants need to be pruned?<br><br>2. When should plants be pruned?<br><br>3. How should plants be pruned? | **Enduring Understanding(s):**<br>1. Pruning helps to keep plants healthy, maintain proper size and proportion, and helps to rejuvenate declining plants.<br>2. The timing of pruning depends on when the plant flowers or bears fruit. Some plants must be pruned after flowering, others must be pruned just before growth begins.<br>3. There are four basic methods of pruning. The type of plant and the desired effect must be considered to determine which pruning method should be used. |

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **<u>Learning Target</u>** | **<u>NGSS or CCS</u>** |
|---|---|
| 1. List five reasons for pruning.<br>2. Describe 4 types of pruning.<br>3. Determine the appropriate pruning technique to use in a variety of pruning situations.<br>4. Determine at what time of year a plant should be pruned.<br>5. Demonstrate proper pruning techniques using hand pruners and lopping shears. | **1. NGSS:** HS-ESS3-3.C,HS-LS1-2 **Other Content Areas:** VPA.9-12.1.1.12.D.1, VPA.9-12.1.3.12.5, WORK.9-12.9.3.12.C.3, RST.11-12.2, 5, 7, 9, 10, WHST.11-12.10<br>**2. NGSS:** HS-ESS3-3.C **Other Content Areas:** WHST.11-12.4, RST.11-12.2, 5, 7, 9, 10, WHST.11-12.10<br>**3. NGSS:** HS-ESS3-3.C, , HS-ETS1-3, HS-ETS1-4, HS-LS1-2 **Other Content Areas:** WORK.9-12.9.1.12.A.1, WORK.9-12.9.3.12.C.3, WHST.11-12.10<br>**4. NGSS:** HS-ESS3-3.C **Other** |

| | |
|---|---|
| | **Content Areas:** WORK.9-12.9.1.12.B.3, WORK.9-12.9.3.12.C.3, WHST.11-12.10 **5. NGSS:** HS-ESS3-3.C **Other Content Areas:** TEC.9-12.8.1.12 A.5, TEC.9-12.8.1.12 B.4, WORK.9-12.9.1.12.A.1, WORK.9-12.9.1.12.B.3, WORK.9-12.9.3.12.C.3, MA.12.4.5 C.3, WHST.11-12.2, 4, 6, 10, HSN.Q.A.2 |

**Inter-Disciplinary Connections:**

**Material presented in this section will connect with material in Math, 21st Century Skills, and art. Students will be measuring lengths and angles, writing scripts and creating multimedia presentations.**

**Examples:**
**Hands on Pruning Practice-** Students will measure the proper lengths angles for making cuts when pruning.
**Pruning Demonstration Project-** Students will assess 3 different plants for proper pruning time and technique and create a scripted multimedia presentation explaining their assessment.

**- examples of assessments and modified assessments are in the District Shared…..**

**Students will engage with the following text:**

***Introductory Horticulture,* Delmar –** Students will use designated sections of the text as a starting point for research into pruning techniques.

**Examples:**
**Unit 33 Reading with Notes**- Students will read pages 388 to 396 and outline key points about pruning

**Accommodations/Modifications**
**Unit 33 Reading and Notes-** Provide students with a skeleton outline to fill in, provide photocopied pages of the book for students to highlight and write on while reading.

**Students will write:**

**In addition to warm ups, homework assignments and answers to lab follow up questions, students will create a scripted presentation.**

**Examples:**

**Pruning reinforcement worksheet**
**Pruning Demonstration Project-** Students will assess 3 different plants for proper pruning time and technique and create a scripted presentation explaining their assessment.

**- examples of assessments and modified assessments are in the District Shared…..**

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

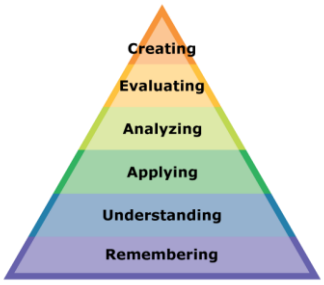
**DESCRIBE THE LEARNING EXPERIENCE.**

**How will students uncover content and build skills.**

- Students will be presented information in the form of multimedia presentations including Powerpoint presentations and videos.
- Students will engage the textbook to learn pruning related vocabulary.
- Students will utilize computer simulations to learn about pruning techniques and practice choosing pruning points on a tree.
- Students will engage in hands on activities in the greenhouse to practice pruning techniques.
- The teacher will observe and critique student progress, provide one on one feedback and ask leading questions to assist student in thinking more critically about pruning techniques.
- Students will create presentations to demonstrate proper pruning technique.

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**Formative Assessments:**

**Formative assessments will be in the form of warm ups, periodic quizzes, text based questions, participation in class and greenhouse activities.**

**Examples:**
**Pruning warm ups- Remembering**
**Pruning Reinforcement worksheet- analyzing**
**Pruning interactive- Applying**
**https://www.arborday.org/trees/pruning/**

**- examples of assessments and modified assessments are in the District Shared…..**

**Accommodations/Modifications:**

**Accommodations and Modifications will be made on a case by case basis. They may include but will not be limited to: reducing number of questions, highlighting/underlining key terms in questions, working with students individually, allowing extra time.**

**Pruning warm ups:** allow students to work with partners, do not make students write in complete sentences, allow students to use notes.
**Pruning Reinforcement worksheet-** allow students to work with partners, do not make students write in complete sentences, allow students to use notes.
**Pruning interactive-** demonstrate use of interactive on smart board, provide step by step directions about what to focus on while working through the interactive, chunk directions, provide graphic organizer to assist students in organizing information while working through the interactive, allow students to work with partners, provide one on one support, allow extra time.

**Summative Assessments:**

**Students will be required to take a test to demonstrate proficiency on the material presented in this unit.**

**Example:**
**Pruning Test - Applying**

**- examples of assessments and modified assessments are in the District Shared…..**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs.**

**Pruning Test:** Limit the number of multiple choice answers, chunk test, make the number of answer choices in matching equal the number of clues, allow students to choose 1 open ended, do not grade open ended for sentence structure or spelling, only grade open ended for content.

**Performance Assessments:**

**Students will be required to turn in homework, participate in greenhouse activities and create a scripted demonstration based on the material in this unit.**

**Examples:**

**Pruning Demonstration Project- Creating**

Students will assess 3 different plants for proper pruning time and technique and create a scripted presentation explaining their assessment.

**- examples of assessments and modified assessments are in the District Shared…..**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs. These may include but will not be limited to: alter grading rubric (example decrease value of spelling/grammar/punctuation for dyslexic students), work with students individually give students extra time to complete, work with students individually, assess comprehension and progress of students throughout completion of project.**

**Pruning Demonstration Project:** Allow student to choose to work with a partner or alone, give students choice in the media used for their presentation, provide graphic organizer to assist student in organizing information, permit student to use cue cards during presentation, allow student to present after school instead of in front of peers.

## Unit 3: Plant propagation and growing conditions

## PART I: UNIT RATIONALE

**WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

<table>
<tr>
<td>Course/Unit Title:<br>Horticulture/ Plant Propagation and Growing Conditions<br><br>Grade Level(s):<br>11th & 12th</td>
<td>Unit Summary:<br>This unit will explore different plant propagation techniques and how to optimize growing conditions. The focus will bounce back and forth between growing conditions and propagation techniques throughout the unit.<br>The Unit will start out on preparing growth media and the greenhouse environmental conditions necessary for propagation. It will then shift to propagation methods including both sexual and asexual methods of propagation. Afterwards the focus will shift back to growing conditions with a focus on plant needs after germination and preparation for transplantation.<br>An exploration into different pests and pathogens that can hinder growth will also be a part of this unit. Common pests and pathogens will be discussed along with methods for preventing and combatting these hindrances to plant growth and productivity.<br>Concepts from this unit will link to every unit taught in this course. Students will need skills learned in the pruning unit for collection of cuttings. Throughout the year students will be working in the greenhouse with plants that were started through propagation techniques learned in this unit. In the politics of food unit we will take a closer look at natural ways to manage pests and pathogens and provide plants with the nutrients they require.</td>
</tr>
<tr>
<td>Essential Question(s):<br>1. What are the different methods of plant propagation?<br><br>2. How does a plant's environment contribute to its ability to thrive?<br><br>3. How are plant pathogens and pests managed?</td>
<td>Enduring Understanding(s):<br><br>1. Plants can be propagated both sexually and asexually. Sexual propagation is accomplished through seeds. Asexual propagation can be accomplished through a number of different methods including soft and hardwood cutting, leaf cuttings, budding, layering, and splitting. Through asexual propagation exact copies of parent plants can be created.<br><br>2. A plant's ability to grow and thrive depends on the correct environmental factors. Environmental factors that need to be taken into consideration when growing plants include but are not limited to water, nutrients, sunlight, temperature, soil type, and pH. Every plant has its own particular needs.<br><br>3. There are a number of diseases and organisms that can prevent a plant from growing and thriving. Proper environmental conditions and help in avoiding these problems. Using chemicals to combat pests and pathogens should always be a last resort.</td>
</tr>
</table>

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **Learning Target** | **NGSS or CCS** |
|---|---|
| 1. Distinguish between sexual and asexual plant propagation methods.<br>2. Identify conditions that assist in seed germination.<br>3.Propagate plants through hard and softwood cuttings.<br>4. Explain how plants are propagated by layering and budding.<br>5. Apply knowledge of proper growth conditions to bedding plant production.<br>6. Describe common plant pathogens and ways to control pest damage.<br>7. Determine the proper conditions under which a plant will thrive.<br>8. Explain how soil conditions affect plant growth. | **1. NGSS:** HS-LS1-2 **Other Content Areas:** RST.11-12.3<br>**2. NGSS:** HS-LS1-2, HS-ETS1-2, 3 **Other Content Areas:** SOC.6.1.12.B.1, TEC.8.1.12A.1, RST.11-12.3<br>**3. NGSS:** HS-LS1-2, HS-ETS1-2, 3 **Other Content Areas:** SOC.6.1.12.B.1 **,**WORK.9.1.12.F.2, WORK.9.3.12.C.13, RST.11-12.3<br>**4. NGSS:** HS-LS1-2 **Other Content Areas:** TEC.8.1.12A.1,2, RST.11-12.3<br>**5. NGSS:** HS-LS4-5, HS-ESS2-5 **Other Content Areas:** TEC.8.1.12A.1,2, WORK.9.1.12.F.2, WORK.9.3.12.C.13, RST.11-12.3<br>**6. NGSS:** HS-LS2-7, HS-LS4-5, HS-ESS3-4, HS-ETS1-2, 3 **Other Content Areas:** SOC.6.1.12.B.1, TEC.8.1.12A.1<br>**7. NGSS:** HS-LS4-5, HS-ESS2-5, HS-ETS1-2, 3 **Other Content Areas:** SOC.6.1.12.B.1, RST.11-12.3, HS-LS4-5<br><br>**8. NGSS:** HS-LS4-5,HS-ESS2-5 **Other Content Areas:** SOC.6.1.12.B.1**,** TEC.8.1.12A.1, WHST.11-12.4 **,** HS-LS4-5 |

## Inter-Disciplinary Connections:

**Material presented in this section will connect with material in 21st Century Skills, and Language Arts. Students will be analyzing tables, research information from a variety of text sources and create informational brochures.**

**Example:**

**Germination Requirements Activity-** Students will be given 5 different packs of seeds. They will create a spreadsheet showing the germination requirements for each seed from the seed packets. They will then utilize internet resources to do further research for germination tips for each type of seed and add to their

spreadsheets.
**Plant Pathogen/Pest Informational Brochure-** Students will research specific plant pathogens and pests utilizing their textbooks and the internet. They will create informational brochures describing the problem and presenting solutions for the problem that are alternatives to chemical treatments.

**- examples of assessments and modified assessments are in the District Shared…..**

**Students will engage with the following text:**

***Introductory Horticulture,*** **Delmar –** Students will use designated sections of the text as a starting point for research propagation techniques, and pathogen and pest management.

Students will also utilize seed packets and catalogs and the internet for research into different plant requirements and pathogen and pest management

**Examples:**
**Germination Requirements Activity**
**Plant Pathogen/Pest Informational Brochure-** Students will research specific plant pathogens and pests utilizing their textbooks and the internet.

**- examples of assessments and modified assessments are in the District Shared…..**

**Students will write:**

**Examples:**
**Plant Pathogen/Pest Informational Brochure-** Students will create informational brochures describing the problem and presenting solutions for the problem that are alternatives to chemical treatments.

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

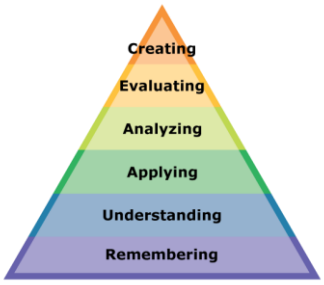
**DESCRIBE THE LEARNING EXPERIENCE.**

**How will students uncover content and build skills.**

- Students will be presented information in the form of multimedia presentations including Powerpoint presentations and videos.
- Students will engage the textbook to learn proper procedure for different propagation techniques and explore growth conditions.
- Students will work in small collaborative groups to research different plants and their growth needs.
- Students will participate in hands on activities in the greenhouse to practice propagation techniques.
- The teacher will observe and critique student progress, provide one on one feedback and ask leading questions to assist student in thinking more critically about propagation techniques.
- Students will utilize the internet and book resources to research plant pests and pathogens.

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**Formative Assessments:**

**Formative assessments will be in the form of warm ups, periodic quizzes, text based questions, participation in class and greenhouse activities.**

**Examples:**
**Hardiness Zone Activity- Applying**
**Growing Conditions Quiz- Remembering**

**- examples of assessments and modified assessments are in the District Shared…..**

**Accommodations/Modifications:**

**Accommodations and Modifications will be made on a case by case basis. They may include but will not be limited to: reducing number of questions, highlighting/underlining key terms in questions, working with students individually, allowing extra time.**

**Hardiness Zone Activity-** Photocopy and blow up seed packets and hardiness zone maps to make it easier for students to read, reduce number of questions.
**Growing Conditions Quiz:** Reduce number of multiple choice answers, bold or underline key words in questions.

**Summative Assessments:**

**Students will be required to take a test to demonstrate proficiency on the material presented in this unit.**

**Example: Plant Propagation and Growing Conditions Test- Analyzing**
**- examples of assessments and modified assessments are in the District Shared…..**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs.**
**Examples: Plant Propagation and Growing conditions Test-** Reduce the number of multiple choice answers, provide a word bank of key terms, allow students to choose from open ended, do not make student write answers to open ended in complete sentences, provide blown up copies of tables and figures to make them easier to read, grade open ended on content only, chunk multiple part open ended with bullets to assist students in answering all aspects of open ended questions, chunk the test.

## Performance Assessments:

**Students will be required to turn in homework, participate in greenhouse activities and create an informational brochure.**

**Examples:**
**Hardwood cutting propagation collection- Applying**
**Propagation of African Violets by leaf - Applying**
**Plant Pathogen/Pest Informational Brochure-Creating**

**- examples of assessments and modified assessments are in the District Shared…..**

## Accommodations/Modifications:

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs. These may include but will not be limited to: alter grading rubric (example decrease value of spelling/grammar/punctuation for dyslexic students), work with students individually give students extra time to complete, work with students individually, assess comprehension and progress of students throughout completion of project.**

**Hardwood cutting propagation collection and propagation of African Violet by leaf:** allow student to work with a partner, provide extra time, provide visual cues to assist in following procedure.
**Plant Pathogen/Pest Informational Brochure:** Supply student with a list of websites to use as a starting point, provide graphic organizers to assist in organizing research, provide time for one on one help, allow extra time, grade only on content and not mechanics, alter grading rubric, demonstrate use of desktop publishing program.

## Unit 4: Plant Anatomy/Bulbs

## PART I: UNIT RATIONALE

**<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

| | |
|---|---|
| **Course/Unit Title:**<br>**Horticulture/Plant Anatomy and bulbs** | **Unit Summary**:<br><br>This unit will introduce students to plant anatomy and relate the anatomy of each parts to their specific function. In the past unit the students studied plant propagation and growing conditions. With the information gained from the prior unit and a detailed explanation and understanding of plant anatomy the students will be prepared for the next unit on managing the greenhouse.<br><br>The beginning of the unit will focus on the necessary processes that plants endure in order to grow and thrive; such as photosynthesis. Next the focus will shift to learning the anatomy of the individual parts of plants. The unit will conclude with students analyzing plants as a whole and studying the subtle anatomy differences between plants. The major concepts from this lesson will be used to connect to the following units and major projects in the entirety of this course. |
| **Grade Level(s):**<br>11th & 12th | |
| **Essential Question(s):**<br><br>1. How does the structure of different plant parts relate to their function?<br><br>2. How are plants involved in biogeochemical cycles? | **Enduring Understanding(s):**<br><br>1. The structure of a plant can be grouped into two major parts: the shoot system and the root system. The shoot system can be further dissected into the parts of the leaf, stem and seeds. Once the students identify the parts of the plants and their functions they will conduct an investigation to dissect a plant and seed. This will provide visual evidence of the relationship between structure and function.<br><br>2. Biogeochemical cycles are an important component for cycling materials and resources throughout the atmosphere. Plants play a major role in the cycle through the exchange of gases; carbon dioxide and oxygen. Through lab investigation the students will explore the exchange of gases and identify the importance of cycling materials. |

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **<u>Learning Target</u>** | **<u>NJCCCS or CCS</u>** |
|---|---|
| 1. Describe the general function of and identify structures in seeds, leaves, stems, roots, and flowers. | **1. NGSS:** HS LS1-2 |

| | |
|---|---|
| 2. Describe the process of photosynthesis and the pigments which are involved in photosynthesis.<br><br>3. Examine biogeochemical cycles and explain why materials need to be cycled.<br><br>4. Analyze a cross section of a woody stem to determine age and growing conditions. | **2. NGSS:** HS LS 2-5; HS ES S2-7<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.3; CCSS.ELA-LITERACY.RST.11-12.9<br><br>**3. NGSS:** HS LS 2-3<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.2; CCSS.ELA-LITERACY.RST.11-12.3<br>**4. NGSS:** HS LS1-3<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.3 |

**Inter-Disciplinary Connections:**

**Material in this section will connect with material in business, math and ecological and biological science. Also, students will create a landscape for a hypothetical customer based on the customers criteria. They will use math skills such as measurement to accurately design the landscape with the space provided. They will also have to identify and account for future growth and cost of the landscape.**

**-- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Students will engage with the following text:**

***Introductory Horticulture,* Delmar**
**Unit 3: "Parts of the Plant and their functions" (26)**
***"Snacking on Sunlight",* Angela Halasey & Heather Kropp**

**Example**: The students will begin the unit by creating a KWL chart about the parts of plants. Then they will read, "Parts of a plant" to introduce themselves to the basic plant parts. The assignment will finish with the students filling out their "learned"section of the chart.

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Students will write:**

**In addition to the usual warm ups, closing activities, lab reports, include example(s) of student activities requiring them to write**

**Examples Include:**
**Virtual Photosynthesis Lab**
**Anatomy of a Plant Poster Project**

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

**DESCRIBE THE LEARNING EXPERIENCE.**
**How will students uncover content and build skills.**

**The students will be presented with material through:**

- **readings from the text *Introductory Horticulture.***
- **online ineractive websites such as Explorelearning.com**
- **video clips and electronic presentations from both the teacher and peers**
- **guest speakers**

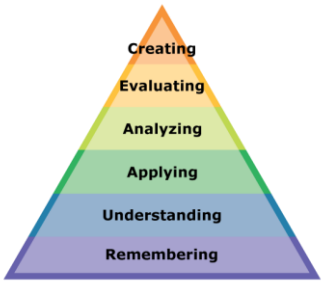
**Strategies that the teacher will use to increase student engagement:**

- **varied group instruction**
- **independent lessons such as POGIL activities**
- **a variety of graphic organizers to aid in reading comprehension**
- **real life examples**

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**Formative Assessments:**

**The teacher will use a variety of formal and informal formative assessments to gage student understanding. The teacher will use warm up questions, exit tickets and classwork to assess the first two levels of Bloom's on a daily basis. Projects, labs and in class group work will be assessments used to reach the middle levels of Bloom's such as applying and analyzing. The top levels of Bloom's will be assessed through essays, projects and major assessments.**

**Example Question (Creating):** Create a mnemonic device to remember the parts of the plants starting from the root system to the shoot system.

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications during this unit are:**

- providing highlighters for students to identify important facts in notes
- allowing for extra time on major assessments
- allowing students to have a printed copy of notes or readings
- incorporating partnered activities as an alternative to independent work
- students can use computer graphics instead of drawing pictures for their project
- students can type their descriptions instead of handwriting them

**Summative Assessments:**

**Students will take a major assessment at the end of the unit to assess for understanding and mastery of the objectives.**

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the summative assessment during this unit are:**

- allowing for extra time on major assessments

- pictures on the test will be projected on the board so the students can easily see them

**Performance Assessments:**

The students will be required to complete two dissection labs for plant anatomy. They will dissect a seed and woody stem. In both activities the students will follow all safety procedures learned from the introduction unit and all of the material covered in the plant anatomy unit. - Applying

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the performance assessment during this unit are:**

- allowing for extra time on major assessments
- small group instruction

## Unit 5: Greenhouse maintenance

## PART I: UNIT RATIONALE

**<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

| **Course/Unit Title:** **Greenhouse Maintenance** | **Unit Summary**: |
|---|---|
| **Grade Level(s):** 11th & 12th | This unit will relate the previously learned conditions of growth to how a greenhouse fosters an environment that is ideal for plant growth. Students will explore heating systems, irrigation, auxiliary lighting, humidity, and proper sanitation. They will investigate the variations in greenhouses while learning what their specific greenhouses offer. This unit will parallel plant production in the greenhouse so students will experience what is required to produce bedding plants for sale. It will allow them an introduction to a profitable part of the horticulture field. |
| **Essential Question(s):**<br>1. What are the parts and function of a greenhouse?<br><br>2. How does each part provide the best possible condition of growth?<br><br>3. How is IPM (integrated pest management used in a greenhouse?<br><br>4. How have greenhouses evolved with technology?<br><br>5. How can greenhouses help profits in agribusiness? | **Enduring Understanding(s):**<br><br>The greenhouse is a focal point in horticulture. In this unit, students will learn how a greenhouse works and how it allows us to grow plants year round for profit, enjoyment, and food. Through IPM, they will understand a more earth-friendly approach to greenhouse management. They will investigate how, through technology, greenhouses are able to produce more today and what that means in their lives. |

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **<u>Learning Target</u>** | **<u>NGSS and or CCS</u>** |
|---|---|
| **1.** Describe the parts of a greenhouse and their function<br><br>**2.** Explain how the parts of a greenhouse work together to create the best possible environment for plant growth<br><br>3. Use IPM to control pests in the greenhouse | **1. NGSS:** HS-LS2-3, HS-LS4-6<br>**2. NGSS:**<br>HS-LS2-3, HS-LS4-6<br>**Other Content Areas:**<br>CCSS.ELA-LITERACY.RST.11-12.9 |

| | |
|---|---|
| **3.** Discover how greenhouses have evolved using technology<br><br>**4.** Interpret how greenhouse technology is allowing horticulturalists to grow more | **3. NGSS:** HS-LS2-6, HS-ETS1-2<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.3, CSS.ELA-LITERACY.RST.11-12.7<br>**3. NGSS:** HS-LS2-3, HS-LS4-6, HS-ETS1-2<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.8, CSS.ELA-LITERACY.RST.11-12.9<br>**4. NGSS:** HS-ETS1-3<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.8,CCSS.ELA-LITERACY.RST.11-12.9 |

**Inter-Disciplinary Connections:**

**Material in this section will connect with material in Environmental Science, Math, History, Health, and Sociology. Students will create an IPM strategy and implement it in the greenhouse to try to reduce their environmental impact. They will use math skills to figure out different parameters of growing plant for profit and analyze their results for profitability.**

**-- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Students will engage with the following text:**

***Introductory Horticulture,* Delmar**
***Greenhouse Lessons,* Penn State Extension Service**

**example: Students will read the introduction to each lesson from the Penn State Extension Service before engaging in it and a guided discussion will follow.**

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Accommodations/Modifications:**
Accommodations and/or modifications will be made on a case by case basis in accordance with individual student needs. These may include but not be limited to: photocopy pages in textbook and give students reading materials

in advance so they can pre-read, highlight, ask questions, and then re-read materials in class, highlight or underline main ideas in reading materials, provide guiding questions to complete when reading to ensure understanding of key concepts, discuss answers to questions when complete to assess comprehension of all students upon completion of reading. If needed, conduct a review of material for test the day before a test.

**Students will write:**

**In addition to the usual warm ups, closing activities, lab reports, include example(s) of student activities requiring them to write**

**Students will participate in a math activity in which they will measure the dimensions of the greenhouse and compute, for example, how many plants can be grown. They will also participate in an activity in which they will learn about IPM and then apply it to their situation.**

**Examples include**

**Greenhouse Math**
**Greenhouse Lessons**

**Accommodations/Modifications:** Accommodations and/or modifications will be made on a case by case basis in accordance with individual student needs. These may include but not be limited to: writing prompts when answering critical thinking questions, reduce amount of writing, provide students with guided notes or copies of notes, give graphic organizers and time lines to help students organize concepts when applicable, reduce length of requirements for writing assignments, reduce number of open ended responses, grade content not spelling

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

**DESCRIBE THE LEARNING EXPERIENCE.**

**How will students uncover content and build skills.**

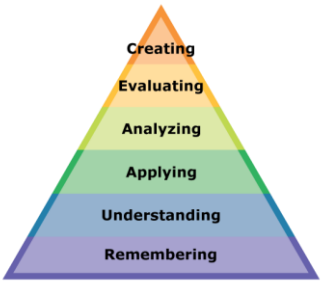
- **Students will be presented with material through text based readings, demonstrations and multi-media presentations utilizing, PowerPoint and videos.**
- **Students will work with/ investigate concepts through:**
  - **Whole class and small group discussions about agriculture, greenhouse profitability, technology, and IPM**
  - **Collaborative activities *Greenhouse Lessons***
- **The teacher will guide whole class and small group discussions by monitoring student input and asking question to elicit student prior knowledge and expand conversation, and provide concrete examples to emphasize real world relevance.**
- **The students might reinforce concepts by completing graphic organizers.**
- **The students might expand upon concepts by visiting web sites aimed a greenhouse management such**

as: http://www.greenhousemag.com

- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**Formative Assessments:**

Formative assessments will be in the form of teacher led discussion of various issues involved in greenhouse management, plant production and IPM, as well as discussions after watching video clips, quizzes and classwork.

- examples of assessments and modified assessments are in the District Shared\Science\CURRICULUM WRITING

**Accommodations/Modifications:**

Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs.
Greenhouse math: shorten assignment, extended time, provide math formulas, break down steps
Greenhouse Lessons: shorten assignment, extended time, breakdown steps, ask leading questions

**Summative Assessments:**

Students will take an exam after reviewing all material and playing a game of greenhouse jeopardy or a game using socrative app.

**Accommodations/Modifications:**

Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs. Some accommodations and/modifications may include extended time, shortened required length of exam, reducing number of multiple choice choices, and open notes.

**Performance Assessments:**

Students will use math skills to maximize profitability of greenhouse, will watch a short video on how a greenhouse provides optimal growing conditions, and participate in several hands on lessons on IPM.

**Accommodations/Modifications:**

Accommodations/Modifications: Accommodations and/or modifications will be made on a case by case basis in accordance with individual student needs. These may include but not be limited to: writing prompts when answering critical thinking questions, reduce amount of writing, provide students with guided notes or copies of notes, give graphic organizers and time lines to help students organize concepts when applicable, reduce length of requirements for writing assignments, reduce number of open ended responses, grade content not spelling, give mathematical formulas, and break down steps of task when necessary.

## Unit 6: Landscape design and maintenance

## PART I: UNIT RATIONALE

**<u>WHY</u> ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

| **Course/Unit Title:**<br>**Horticulture/Landscape design and maintenance** | **Unit Summary**:<br><br>This unit will introduce students to landscape design and maintenance. The unit will begin with the basics of landscape design and analyzing existing landscapes for pros and cons. The students will be looking specifically at the choice of plants for the growing conditions. They will also take into account other sources of impact to a landscape such as pests and animals.<br><br>Then the focus of the unit will shift to challenge students to use all of the concepts learned thus far in the course to design a landscape. The students will have to analyze plant anatomy, design cost, growing conditions and maintenance. Creating their own landscape will allow the students to demonstrate if they understand the key concepts taught in the course. |
|---|---|
| **Grade Level(s):**<br>11th & 12th | |
| **Essential Question(s):**<br><br>1. How are landscapes designed to be effective?<br><br>2. Why is maintaining the landscape important?<br><br>3. Why is plant choice important in designing a landscape? | **Enduring Understanding(s):**<br><br>1. Landscapes can be designed for different purposes but an effective landscape will follow the five principles of landscape design. The five principles of landscape design allow for an effective design that is easily maintained.<br>2. Landscape maintenance is important not only for aesthetics but also for cycling of materials.<br>3. Understanding the difference between annuals, perennials and types of deciduous trees is important when planting a landscape. The landscaper wants to keep consistency in the landscape and the best environment for each plant. For example, plants that grow best in full sun environments should be placed in full sun. |

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **<u>Learning Target</u>** | **<u>NJCCCS or CCS</u>** |
|---|---|
| 1. Identify the major types of plants used in landscape design.<br><br>2. Apply the principles of landscape design to create his/her own design based on the needs of a hypothetical client.<br><br>3. Maintain an already existent landscape. | **1. NGSS:**<br>**Other Content Areas:**<br>**CCSS.ELA-LITERACY.RST.11-12.2**<br><br>**2. NGSS:** HS ESS2-2<br>**Other Content Areas:** |

| | |
|---|---|
| 4. Choose appropriate plants for different environmental conditions.<br><br>5. Evaluate existing landscapes and make improvements based on the knowledge of the plants the planting area. | CCSS.ELA-LITERACY.RST.11-12.9<br><br>**3. NGSS:** HS ESS2-2<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.7<br><br>**4. NGSS:** HS LS2-3<br><br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.7<br>**5. NGSS:** HS ESS3-2; HS ETS1-3<br><br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.7 |

**Inter-Disciplinary Connections:**

Material in this section will connect with material in business, math and ecological and biological science. Also, students will create a landscape for a hypothetical customer based on the customers criteria. They will use math skills such as measurement to accurately design the landscape with the space provided. They will also have to identify and account for future growth and cost of the landscape.

-- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING

**Students will engage with the following text:**

***Introductory Horticulture,*** **Delmar**
**Unit 34: Section, "The Principles of Landscape Design" (405)**

**Example**: The students will reading the section titled, "Using Plants in the Landscape" to introduce themselves to landscape design and techniques. Then they will follow up with "The Principles of Landscape Design" before completing their unit project.

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Students will write:**

**In addition to the usual warm ups, closing activities, lab reports, include example(s) of student activities requiring them to write**

The students will be evaluating existing landscapes on the school grounds based on the five landscape principles. They will have to write up their evaluation and include evidence as to why they rated the landscape effective or not.

In addition, during the landscape design project, the students will be writing a rationale for their design. The rationale will explain why they made certain decisions such as plant choice and placement in the landscape.

## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

**DESCRIBE THE LEARNING EXPERIENCE.**

**How will students uncover content and build skills.**

The students will be presented with material through:

- readings from the text *Introductory Horticulture.*
- online ineractive websites such as Explorelearning.com
- video clips and electronic presentations from both the teacher and peers
- guest speakers

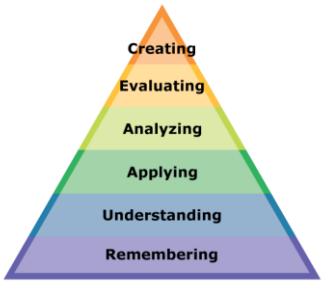
Strategies that the teacher will use to increase student engagement:

- varied group instruction
- independent lessons such as POGIL activities
- a variety of graphic organizers to aid in reading comprehension
- real life examples

- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING

## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**




**Formative Assessments:**

**The teacher will use a variety of formal and informal formative assessments to gage student understanding. The teacher will use warm up questions, exit tickets and classwork to assess the first two levels of Bloom's on a daily basis. Projects, labs and in class group work will be assessments used to reach the middle levels of Bloom's such as applying and analyzing. The top levels of Bloom's will be assessed through essays, projects and major assessments.**

**Example Question (Applying):** Read the scenario given and apply the five principles of landscape to create an effective design.

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications during this unit are:**

- providing highlighters for students to identify important facts in notes
- allowing for extra time on major assessments
- allowing students to have a printed copy of notes or readings
- incorporating partnered activities as an alternative to independent work
- students can use computer graphics instead of drawing pictures for their project
- students can type their descriptions instead of handwriting them

**Summative Assessments:**

Students will take a major assessment at the end of the unit to assess for understanding and mastery of the objectives. They will also be completing the landscape design project to show mastery of this unit.

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the summative assessment during this unit are:**

- allowing for extra time on major assessments
- pictures on the test will be projected on the board so the students can easily see them

**Performance Assessments:**

Students will be completing the landscape design project to show mastery of this unit. The project will require them to transfer the knowledge learned so far in the course. They will analyze the information, apply the concepts to landscape design, evaluate the growing conditions, and then create the landscape.

**Accommodations/Modifications:**

**The accommodations and modifications will be made on a case by case basis for the needs of individual students. Examples of possible accommodation/modifications for the performance assessment during this unit are:**

- allowing for extra time on major assessments
- small group instruction

## Unit 7: The Politics of Food

## PART I: UNIT RATIONALE

**WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?**

<table>
<tr><td>Course/Unit Title:<br>The Politics of Food</td><td rowspan="2">Unit Summary:<br><br>This unit will encourage students to evaluate their food choices. They will learn what it means for produce to be organic and compare and contrast it with conventional farming. Having grown a number of plants they will be able to have some sense of what large scale plant production is and will be able to evaluate the economic, political and social aspects of each method.<br>They will learn the economic, political, and nutritious impact on our society that corn has played and the repercussions it has had on our food choices. They will learn the history of American farming and how and why is has evolved to what it is today.<br>Though following food from farm to table, students will learn how they can exercise their power as consumers by the choices they make. It is the goal of this unit to develop students into critical thinkers who take control of one of the most important basic needs of a culture.</td></tr>
<tr><td>Grade Level(s):<br>12th</td></tr>
<tr><td>Essential Question(s):<br>1. What are sustainable farming practices?<br><br>2. What does it mean to be organic?<br><br>3. What is a GMO(genetically modified organism)?<br><br>4. Why is corn grown in such abundance in this country?</td><td>Enduring Understanding(s):<br><br>We make decisions on what food we’re going to eat, buy, or grow almost everyday. This unit will give students the tools they need to know the implications of those choices on themselves, people they care for, society, and the environment. This will allow them to be informed consumers and hopefully voters that will shape the future.</td></tr>
</table>

## PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

**DESCRIBE THE LEARNING TARGETS.**

**After each target, identify the NJCCCS or Common Core Standards that are applicable**

| **Learning Target** | **NGSS or CCS** |
|---|---|
| **1. Identify sustainable farming practices.**<br><br>**2. Understand why soil quality is linked to successful growing.**<br><br>**3. Describe what it means to be organic.**<br><br>**4. Explain what a genetically modified organism (GMO) is and the history and controversy surrounding it.**<br><br>**5. Describe how corn has become the cash crop that it is and how that affects the food supply in this country.**<br><br>**6. Evaluate their food choice based on political, socioeconomic, and nutritional aspects.** | **1. NGSS:** HS-LS2-5, HS-LS2-6, HS-LS2-7<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.2, CCSS.ELA-LITERACY.RST.11-12.6<br><br>**2. NGSS:** HS-LS2-3, HS-LS2-5, HS-LS2-7, HS-LS4-6<br>**Other Content Areas:** CCSS.ELA-LITERACY.RST.11-12.7, CCSS.ELA-LITERACY.RST.11-12.8, CCSS.ELA-LITERACY.RST.11-12.9<br><br>**3. NGSS:** HS-LS2-7<br>**Other Content Areas: CCSS.ELA-LITERACY.RST.11-12.6, CCSS.ELA-LITERACY.RST.11-12.7**<br><br>**4. NGSS:** HS-LS2-7<br>**Other Content Areas: CCSS.ELA-LITERACY.RST.11-12.7**<br><br>**5. NGSS:** HS-LS2-7<br>**Other Content Areas: CCSS.ELA-LITERACY.RST.11-12.7**<br><br>**6. NGSS:** HS-LS2-7, |

| | |
|---|---|
| | HS-ETS1-3<br>**Other Content Areas:**<br>**CCSS.ELA-LITERACY.RST.11-12.5**<br>**CCSS.ELA-LITERACY.RST.11-12.6,**<br>**CCSS.ELA-LITERACY.RST.11-12.7,** |

**Inter-Disciplinary Connections:**

**Material in this section will connect with material in Environmental Science, Math, History, Health, and Sociology. Students will compare and contrast conventional farming with sustainable agriculture and synthesize all they have learned to evaluate their food choices for health, environmental impact and other socioeconomic factors.**

**-- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Students will engage with the following text:**

***Introductory Horticulture,* Delmar**
***Sustainable vs. Conventional Agriculture*, journal article**
**example: After reading *Sustainable vs. Conventional Agriculture,* list 5 factors that compare and 5 that contrast.**

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Accommodations/Modifications:**
**Accommodations and/or modifications will be made on a case by case basis in accordance with individual student needs. These may include but not be limited to: photocopy pages in textbook and give students reading materials in advance so they can pre-read, highlight, ask questions, and then re-read materials in class, highlight or underline main ideas in reading materials, provide guiding questions to complete when reading to ensure understanding of key concepts, discuss answers to questions when complete to assess comprehension of all students upon completion of reading. If needed, conduct a review of material for test the day before a test.**

**Students will write:**

Students will engage in several activities in which they will write. They will make powerpoint presentations, answer essay questions as part of the food label analysis, and write an opinion essay.

**Examples include:**
**Dirt Powerpoint**
**Food Label Activity**

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**

**Accommodations/Modifications: Accommodations and/or modifications will be made on a case by case basis in accordance with individual student needs. These may include but not be limited to: writing prompts when answering critical thinking questions, reduce amount of writing, provide students with guided notes or copies of notes, give graphic organizers and time lines to help students organize concepts when applicable, reduce length of requirements for writing assignments, reduce number of open ended responses, grade content not spelling/grammar/mechanics when grading written assessments**

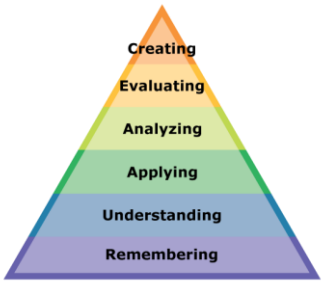
## PART III: TRANSFER OF KNOWLEDGE AND SKILLS

**DESCRIBE THE LEARNING EXPERIENCE.**

**How will students uncover content and build skills.**

- **Students will be presented with material through text based readings, demonstrations and multi-media presentations utilizing, PowerPoint and videos.**
- **Students will work with/ investigate concepts through:**
  - **Whole class and small group discussions about agriculture, gmo's and the prevalence of corn in our food supply**
  - **Collaborative activities such as *Dirt* powerpoint**
- **The teacher will guide whole class and small group discussions by monitoring student input and asking question to elicit student prior knowledge and expand conversation, and provide concrete examples to emphasize real world relevance.**
- **The students might reinforce concepts by completing graphic organizers or arguing their opinion in a debate.**
- **The students might expand upon concepts by visiting web sites aimed at sustainable agriculture such as: http://www.sustainabletable.org/246/sustainable-agriculture-the-basics**
-

**- examples of strategies and modified strategies are in the District Shared\Science\CURRICULUM WRITING**




## PART IV: EVIDENCE OF LEARNING

**IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR**
**UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.**
**IDENTIFY BLOOM'S LEVELS.**

**Formative Assessments:**

**Formative assessments will be in the form of teacher led discussion of various issues involved in the politics of food, as well as discussions after watching videos (*Dirt* and *In Organic We Trust*), quizzes and classwork.**

**- examples of assessments and modified assessments are in the District Shared\Science\CURRICULUM WRITING**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs.**
**Dirt Powerpoint extended time, provide the DVD to students who need to review parts of film, collaboration, require fewer slides for presentation**
**Food label activity shorten assignment, extended time, require less writing for each answer, prompts from teacher if necessary, and work collaboratively**

**Summative Assessments:**

**Students will be required to write a position paper on how we can manage the issue of how we get our food and what they are going to do in their own lives to be part of the solution.**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student needs.**
**Some accommodations and/modifications may include extended time, shortened required length of essay, simplifying of the task, providing additional resources**

**Performance Assessments:**

**Students will research more deeply a theme in soil conservation and present it to the class in a powerpoint presentation, they will engage in a food label analysis, they will write a position paper on their role in the process of producing food as consumers and they will be involved in classwork tasks that help build their understanding.**

**Accommodations/Modifications:**

**Accommodations and, or modifications will be made on a case by case basis in accordance with individual student need. These may include but not be limited to: writing prompts when answering critical thinking questions, reduce amount of writing, provide students with guided notes or copies of notes, give graphic organizers and time lines to help students organize concepts when applicable, reduce length of requirements for writing assignments, reduce number of open ended responses, grade content not spelling/grammar/mechanics when grading written assessments.**

BLACK HORSE PIKE REGIONAL SCHOOL DISTRICT
HIGHLAND TIMBER CREEK TRITON
SCIENCE DEPARTMENT

# SYLLABUS
# Horticulture

The Horticulture course provides the student with an opportunity to develop an understanding and appreciation for plant growth and production. It explores the greenhouse as a helpful tool in plant production.

**Course Expectations & Skills**

**September: Introduction to the Greenhouse and Careers in Horticulture**

Describe the career fields in horticulture and the education and experience necessary to obtain a job in the field.
Explain how a greenhouse works.
Identify garden tools and their uses in landscape and apply safety practices to handle and care for the greenhouse and tools.
Determine the appropriate pruning technique to use in a variety of pruning situations.

**October: Pruning**

Determine the appropriate pruning technique to use in a variety of pruning situations.
Determine at what time of year a plant should be pruned.
Demonstrate proper pruning techniques using hand pruners and lopping shears.

**November-December: Plant Propagation and Growing Conditions**

Propagate plants through hard and softwood cuttings, layering and budding.
Apply his/her knowledge of proper growth conditions to bedding plant production.
Determine the proper conditions under which a plant will thrive.
Explain how soil conditions affect plant growth.

**December-January: Plant Anatomy and Bulbs**

Describe the general function of and identify structures in seeds, leaves, stems, roots, and flowers.
Describe the process of photosynthesis and the pigments which are involved in photosynthesis.
Analyze a cross section of a woody stem to determine age and growing conditions.

**February: Greenhouse Management**

Describe various types of irrigation systems.
Compare/contrast greenhouses made from different materials.
Compare and contrast different climate control methods for greenhouses.
Describe common plant pathogens and ways to control pest damage.
Relate greenhouse technology to plant growth conditions.

## March- April: Landscape Design and Maintenance

Identify the major types of plants used in landscape design.
Apply the principles of landscape design to create his/her own design based on the needs of a hypothetical client.
Maintain an already existent landscape.
Choose appropriate plants for different environmental conditions.

## May-June: Politics of Food

Explain how soil quality can be improved and maintained through sustainable farming practices.
Describe irrigation methods that can be used to reduce water loss.
Compare and contrast sustainable farming to traditional commercial farming.
List the qualifications food must have to be considered organic.
Evaluate the environmental, economic, health, and sociopolitical costs and benefits to organic farming.
Explain what a GMO is and describe the history of GMOs.
Evaluate the environmental, economic, health, and sociopolitical costs associated with GMOs.

## Course Expectations & Skills

1. Describe how the greenhouse works and how it creates the optimal growing conditions.
2. Apply the theoretical aspects of the textbook and lesson material in selected laboratory investigations and greenhouse work.
3. Expand classroom information by analyzing related current readings and films in agriculture..
4. Demonstrate proper technique in greenhouse tasks and plant production.
5. Understand where their food comes from and analyse their food decisions on our society and their individual health.

## Resources

Primary Text: ***Introductory Horticulture,*** **Delmar**
Supplementary resources include: **"Greenhouse Lessons" Penn State Extension; www.greenhousemag.com; and agriculture sustainability Institute (ASI) http://www.sarep.ucdavis.edu/about-sarep/def**

### Grading Scale

Grades are calculated according to the following proportions:

Major Assessment: 40%
Minor Assessments: 10%
Labs: 30%
Practice: 20%