

**Department of Agriculture Integrated Pest Management
Maine Curriculum Alignment: Grade 4 and Grade 5**

<p><i>Unit / Lesson</i></p> <p>** = Core Lessons</p>	<p><i>Maine State Learning Results (Grades 3-5) Performance Indicators and Descriptors</i></p>	<p><i>New England Common Assessment Program Grade Level Expectations</i></p>	<p><i>National Science Education Content Standards</i></p>	<p><i>Grade-Level Expectations Students should be able to:</i></p>	<p><i>Assessment Standards</i></p>
<p>Unit 1: Biodiversity</p> <p>Lesson 1: Everybody is Somebody's Lunch</p> <p>**Session 1: Food Chains</p> <p>* To determine in what ways living things are connected. * To understand that systems are complex in their connections. * To learn what happens if certain components of a system are removed. * To determine the effect of pest management strategies on food chains and food webs. (SCI)</p>	<p>LA/E1 – Listening</p> <ol style="list-style-type: none"> Ask clarifying questions. Attend and respond appropriately to classmates and adults. Follow multi-step oral instructions. <p>SCI/E1 – Biodiversity</p> <ol style="list-style-type: none"> Describe how living things can be sorted in many ways, depending on which features or behaviors are used to sort them, and apply this understanding to sort living things. <p>SCI/E2 – Ecosystems</p> <ol style="list-style-type: none"> Explain how changes in an organism's habitat can influence its survival. Describe some of the ways in which organisms depend on one another. Explain how organisms can affect the environment in different ways. 	<p>Numbers and Operations</p> <p>M(N&O)–3–2 Demonstrate understanding of the relative magnitude of numbers from 0 to 999 by ordering whole number; by comparing whole numbers to benchmark whole numbers (100, 250, 500, or 750); or by comparing whole number to each other.</p>	<p>Unifying Concepts and Processes</p> <ul style="list-style-type: none"> Standard A: As a result of activities in grades K-12, all students should develop understanding and abilities aligned with the following concepts and processes: <ul style="list-style-type: none"> Systems, order, and organization Evidence, models, and explanation Constancy, change, and measurement Evolution and equilibrium Form and function 	<ol style="list-style-type: none"> Identify various sources of food. Distinguish a food chain from a food web. Give examples of ways that living and nonliving things are interdependent within an ecosystem. Draw diagrams showing how the sun's energy enters and is transferred from producers to consumers in a local land or aquatic food chain. Predict the effect an environmental change, such as drought or forest destruction, might have on the community of living things. 	<ol style="list-style-type: none"> Demonstrate comprehension of text(s) by stating connections or inferences made and stating questions or conclusions that indicate deeper understanding. Analyze and organize information in graphic form. Describe how animals, directly or indirectly, depend on plants to provide the food and energy they need in order to grow and survive.

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<p>Biodiversity</p> <p>Lesson 1: Everybody is Somebody's Lunch</p> <p>**Session 2: Food Webs</p> <p>* To identify various sources of foods. * To distinguish a food chain from a food web. (SCI)</p>	<p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources a. Follow an established procedure for locating sources appropriate to reading level. b. Collect information for a specific purpose. c. Organize findings. d. Share information gathered using oral and visual examples.</p> <p>SCIE2 – Ecosystems Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms. a. Explain how changes in an organism's habitat can influence its survival. b. Describe that organisms all over the Earth are living, dying, and decaying, and new organisms are being produced by the old ones.</p>	<p>Data, Statistics, and Probability</p> <p>M(DSP)–2–1 Interprets a given representation (pictographs with one-to-one correspondence, line plots, tally charts, or tables) to answer questions related to the data, or to analyze the data to formulate conclusions.</p> <p>M(DSP)–3–2 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using most frequent (mode), least frequent, largest, or smallest.</p> <p>Initial Understanding of Informational Texts</p> <p>R–3–7.3 Organizing information to show understanding (e.g., representing main/central ideas or details within text through charting or mapping)</p>	<p>Unifying Concepts and Processes</p> <ul style="list-style-type: none"> • Standard: As a result of activities in grades K-12, all students should develop understanding and abilities aligned with the following concepts and processes: <ul style="list-style-type: none"> ○ Systems, order, and organization ○ Evidence, models, and explanation ○ Constancy, change, and measurement ○ Evolution and equilibrium ○ Form and function <p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry 	<ol style="list-style-type: none"> 1. Identify various sources of food. 2. Distinguish a food chain from a food web. 3. Understand the relationships between organisms and their environments. 	<ol style="list-style-type: none"> 1. Describe how food webs show many and varied food chains and how they connect. 2. Explain how any change in one link affects all other parts of the food chain and impacts the food web as well. 3. Understand that food webs are just one example of Nature's many cycles.

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<p>Biodiversity</p> <p>Lesson 2: “I” is for Invasive</p> <p>* To distinguish between native and non-native plant species in the United States.</p> <p>* To understand the economic impact of certain invasive species, such as Oriental bittersweet, Japanese knotweed, and leafy spurge.</p> <p>* To determine the geographical extent of the infestation of selected plants. (SCI, LA)</p>	<p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources</p> <p>a. Follow an established procedure for locating sources appropriate to reading level.</p> <p>b. Collect information for a specific purpose.</p> <p>c. Organize findings.</p> <p>d. Share information gathered using oral and visual examples.</p> <p>SCIE/E1 – Biodiversity Students compare living things based on their behaviors, eternal features, and environmental needs.</p> <p>a. Describe how living things can be sorted in many ways, depending on which features or behaviors are used to sort them, and apply this understanding to sort living things.</p>	<p>Initial Understanding of Informational Texts</p> <p>R–3–7.2 Using information from the text to answer questions related to explicitly stated main/central ideas or details</p> <p>R–3–7.3 Organizing information to show understanding (e.g., representing main/central ideas or details within text through charting or mapping)</p>	<p>Unifying Concepts and Processes</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-12, all students should develop understanding and abilities aligned with the following concepts and processes: <ul style="list-style-type: none"> ○ Systems, order, and organization ○ Evidence, models, and explanation ○ Constancy, change, and measurement <p>Life Science</p> <ul style="list-style-type: none"> • Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments 	<ol style="list-style-type: none"> 1. Recognize what is an invasive plant, and what are some examples of invasive plants. 2. Create a graph to show states with the most problems with invasive plants. 	<ol style="list-style-type: none"> 1. Understand that they need to learn to identify, detect, and control invasive plants. 2. Identify the economic and environmental impact invasive plants have on their community, state, country, and world.

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<p>Unit 2: IPM</p> <p>**Lesson 1: Before You Spray, Try Another Way</p> <p>* To illustrate an understanding of IPM (Integrated Pest Management). * To recognize the need for reduction of chemical applications in pest management. (SCI, LA)</p>	<p>LA/A1-f - Comprehension Students demonstrate comprehension of text(s) by stating connections or inferences made and stating questions or conclusions that indicate deeper understanding(s).</p> <p>SCI/E2 – Ecosystems Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms. e. Explain how organisms can affect the environment in different ways.</p>	<p>Analysis and Interpretation of Informational Texts/Citing Evidence</p> <p>R–3–8: Analyze and interpret informational texts, citing evidence where appropriate by: R–3–8.3 Making basic inferences, drawing basic conclusions, or forming judgments/opinions about central ideas that are relevant.</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments 	<ol style="list-style-type: none"> 1. Explain how different objects presented can be used to non-chemically control pests. 2. Understand the detrimental affects that chemical pesticides have on life and the environment. 3. Write, speak, or draw ways that weather influences humans, other animals and plants. 	<ol style="list-style-type: none"> 1. Describe the methods IPM supports to manage pests: physical, mechanical, cultural, and biological.

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<p>Unit 3: Lifestyles</p> <p>Section 1: Animals</p> <p>**Lesson 1: Extreme Makeover</p> <p>* To understand the concept of life cycles. * To recognize that among living organisms there are similarities and differences in regard to life stages and life spans. * To increase ability in the use of mathematical data to create reasonable explanations. (SCI, LA, Math)</p>	<p>SCIE/E1 – Biodiversity Students compare living things based on their behaviors, external features, and environmental needs. a. Describe how living things can be sorted in many ways, depending on which features or behaviors are used to sort them, and apply this understanding to sort living things. b. Describe the changes in external features and behaviors of an organism during its life cycle.</p> <p>MA/A2 – Computation Students add, subtract, multiply, and divide numbers up to four digits by numbers up to two digits.</p> <p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources b. Collect information for a specific purpose. c. Organize findings. d. Share information gathered using oral and visual examples.</p>	<p>Data, Statistics, and Probability</p> <p>M(DSP)–2–1 Interprets a given representation (pictographs with one-to-one correspondence, line plots, tally charts, or tables) to answer questions related to the data, or to analyze the data to formulate conclusions.</p> <p>Computation M(N&O)–4–4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.)</p>	<p>Science as Inquiry</p> <ul style="list-style-type: none"> Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> Abilities necessary to do scientific inquiry Understanding about scientific inquiry <p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments 	<ol style="list-style-type: none"> Make scientific observations on an insect’s observable properties and its name and its uses. Observe and write, speak or draw about similarities and differences in appearance, life cycle, and behaviors of various animals and insects. Describe the four stages of a monarch butterfly’s development. Compute a representative generation equation through the use of addition, subtraction, and division. 	<ol style="list-style-type: none"> Construct a Venn diagram to show how the human and monarch butterfly’s life spans are alike and different. Describe the similarities and differences in the appearance, life cycle, and behaviors of insects.

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<p>Unit 3: Lifestyles</p> <p>Section 1: Animals</p> <p>**Lesson 2: Migration Relay</p> <p>* To understand the purpose of monarch migration. * To understand the pattern of monarch migration. * To increase map reading skills. * To compute accurately and make reasonable estimates based on data.</p> <p>(SCI, LA, Math, SS, Art)</p>	<p>.LA/E1 - Listening Students apply active listening skills. a. Ask clarifying questions. b. Attend and respond appropriately to classmates and adults. c. Follow multi-step instructions</p> <p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work. a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p> <p>MA/A2 – Computation Students add, subtract, multiply, and divide numbers up to four digits by numbers up to two digits.</p>	<p>Breadth of Vocabulary R–3–3: Shows breadth of vocabulary knowledge through demonstrating understanding of word meanings or relationships by:</p> <ul style="list-style-type: none"> • R–3–3.1 Identifying synonyms, antonyms, or homonyms/homophones; or categorizing words. <p>Computation M(N&O)–4–4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators. (Multiplication limited to 2 digits by 2 digits, and division limited to 1 digit divisors.)</p>	<p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry <p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments 	<ol style="list-style-type: none"> 1. Describe the migration patterns that monarchs follow. 2. Use mathematical computations (addition, subtraction, and division) to solve problems. 3. Understand a map and chart migration routes. 	<ol style="list-style-type: none"> 1. Understand that the annual migration of monarch butterflies is actually a journey involving four generations. 2. Utilize written and internet resources to chronicle the journey that monarch butterflies make every spring

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<p>Unit 3: Lifestyles</p> <p>Section 1: Animals</p> <p>Lesson 3: Better Homes and Gardens</p> <p>* To determine the needs of butterflies. * To create an environment in which butterflies will thrive. * To recognize the importance of becoming Earth stewards. (SCI, LA, Math, Art)</p>	<p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources b. Collect information for a specific purpose. c. Organize findings. d. Share information gathered using oral and visual examples.</p> <p>SCI/A1 – Systems Students explain interactions between parts that make up whole man-made and natural things. a. Give examples that show how individual parts of organisms, ecosystems, or man-made structures can influence on another. b. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing, broken, mismatched, or misconnected.</p> <p>Math/D2 – Data Analysis Students collect and represent data in tables, line plots, and bar graphs, and read and interpret these types of data displays.</p>	<p>Data, Statistics, and Probability</p> <p>M(DSP)–4–1 Interprets a given representation (line plots, tables, bar graphs, pictographs, or circle graphs) to answer questions related to the data, to analyze the data to formulate or justify conclusions, to make predictions, or to solve problems.</p> <p>M(DSP)–5–3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M(DSP)–5–1.</p>	<p>Science as Inquiry</p> <ul style="list-style-type: none"> Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> Abilities necessary to do scientific inquiry Understanding about scientific inquiry <p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>Living things have different structures and behaviors that allow them to meet their basic needs.</p>	<ol style="list-style-type: none"> Create an environment that butterflies need to survive and grow. Identify structures and behaviors used by mammals, birds, amphibians, reptiles, fish and insects to move around, breathe and obtain food and water (e.g., legs/wings/fins, gills/lungs, claws/fingers, etc.) Write a thank you letter with proper organization and grammar. 	<ol style="list-style-type: none"> List and describe the needs of living things to survive. Describe the structures that animals, including humans, use to eat. Understand that next to bees, butterflies are the chief pollinators of plants and vital to our environment.

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<p>Unit 3: Lifestyles</p> <p>Section 1: Animals</p> <p style="text-align: center;">Lesson 4: Flag on the Playing Field</p> <p>* To recognize the relationship between predator and prey. * To understand that certain prey behavior enables the prey to avoid predators. * To recognize that nature provides biological control methods. * To better understand the importance of cooperation among group members. (SCI, Phys, Math)</p>	<p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work.</p> <p>a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p> <p>SCI/E1 – Biodiversity Students describe similarities and differences in the observable behaviors, features, and needs of plants and animals.</p> <p>a. Describe similarities and differences in the way plants and animals look and the things that they do. b. Describe some features of plants and animals that help them live in different environments. c. Describe how organisms change during their lifetime.</p>	<p>Computation M(DSP)–5–2 Analyzes patterns, trends, or distributions in data in a variety of contexts by determining or using measures of central tendency (mean, median, or mode) or range to analyze situations, or to solve problems.</p>	<p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry <p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments 	<ol style="list-style-type: none"> 1. Create/describe characteristics and/or adaptations that predators and prey need to survive 2. Work cooperatively as a member of a team to achieve goals. 3. Tally, analyze, and draw conclusions from data collected. 	<ol style="list-style-type: none"> 1. Recognize that cooperative behavior is involved in successful social interactions. 2. Understand that nature provides natural enemies for both plant and animal populations. 3. Realize that man sometimes interferes with nature’s natural order and sometimes enhances it.
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<p>Unit 3: Lifestyles</p> <p>Section 2: Plants</p> <p>**Lesson 1: Earth: Planet of Plants</p> <p>* To understand the interdependency of plants and animals.</p> <p>* To identify the ways that plants survive in diverse environments. (SCI, LA, Geo)</p>	<p>.SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work.</p> <p>a. Describe how scientific investigations involve asking and answering a question.</p> <p>b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p> <p>SCI/E1 – Biodiversity Students describe similarities and differences in the observable behaviors, features, and needs of plants and animals.</p> <p>b. Describe some features of plants and animals that help them live in different environments.</p> <p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources</p> <p>b. Collect information for a specific purpose.</p> <p>c. Organize findings.</p> <p>d. Share information gathered using oral and visual examples.</p>	<p>R–4–7: Demonstrate initial understanding of informational texts (expository and practical texts) by...</p> <p>R–4–7.2 Using information from the text to answer questions related to explicitly stated main/central ideas or key details</p> <p>R–4–7.3 Organizing information to show understanding (e.g., representing main/central ideas or details within text through charting, mapping, paraphrasing, or summarizing)</p>	<p>Science as Inquiry</p> <ul style="list-style-type: none"> Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> Abilities necessary to do scientific inquiry Understanding about scientific inquiry <p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>Living things have different structures and behaviors that allow them to meet their basic needs.</p>	<ol style="list-style-type: none"> Give examples of ways that living and nonliving things are interdependent within an ecosystem. Identify the ways that plants survive in diverse environment. 	<ol style="list-style-type: none"> Distinguish that plants are the basis of life on Earth because green plants produce their own food and provide food for all other living things. Understand the interdependency of plants and animals.

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<p>Unit 3: Lifestyles</p> <p>Section 2: Plants</p> <p>**Lesson 2: Presto, Changeo</p> <p>* To understand the process of photosynthesis.</p> <p>* To recognize the importance of green plants. (SCI, Math)</p>	<p>SCIE/E1 – Biodiversity Students describe similarities and differences in the observable behaviors, features, and needs of plants and animals.</p> <p>b. Describe some features of plants and animals that help them live in different environments.</p> <p>Math/A3 – Students solve problems requiring multiple operations (addition, subtraction, multiplication, and division) and use multiples of a given number.</p>	<p>W–4–6.1 Grouping ideas logically (e.g., predictable categories, steps of a procedure, reasons/arguments)</p> <p>M(N&O)–4–4 Accurately solves problems involving multiple operations on whole numbers or the use of the properties of factors and multiples; and addition or subtraction of decimals and positive proper fractions with like denominators.</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Living things have different structures and behaviors that allow them to meet their basic needs.</p> <p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry 	<ol style="list-style-type: none"> 1. Demonstrate how green plants accomplish the process of photosynthesis. 2. Work together cooperatively to achieve a goal. 3. Draw diagrams showing how the sun’s energy enters and is transferred from producers to consumers in a local land or aquatic food chain. 	<ol style="list-style-type: none"> 1. Describe the cause and effect relationship between sunlight and chlorophyll productions (photosynthesis) 2. Recognize that because green plants are the only living organisms capable of producing their own food, all other living organisms depend on them either directly or indirectly for survival..

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<p>Unit 4: Pest vs. Pal</p> <p>**Lesson 1: A Pest By Any Other Name</p> <p>* To explore human attitudes toward “bugs.”</p> <p>* To understand the role insects play in nature.</p> <p>* To examine helpful and harmful pests and pals.</p> <p>* To devise alternative methods, other than chemicals, to control pests.</p> <p>(SCI, LA)</p>	<p>.SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work.</p> <p>a. Describe how scientific investigations involve asking and answering a question.</p> <p>b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p> <p>SCI/E1 – Biodiversity Students describe similarities and differences in the observable behaviors, features, and needs of plants and animals.</p> <p>b. Describe some features of plants and animals that help them live in different environments.</p>	<p>W-6 Informational Writing: Reports, Procedures, or Persuasive Writing- Organizing Information</p> <p>W-4-6.1 Grouping ideas logically (e.g., predictable categories, steps of a procedure, reasons/arguments)</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Living things have different structures and behaviors that allow them to meet their basic needs.</p> <ul style="list-style-type: none"> – Plants need air, water and sunlight to survive. <p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry 	<ol style="list-style-type: none"> 1. Research and complete an insect “wanted” poster describing the pest and reasons why it is considered a pest and not a pal. 2. Discuss and give examples of IPM control methods (biological, mechanical, cultural, chemical) using word cards. 	<ol style="list-style-type: none"> 1. Understand that not all insects are pests, that there are many reasons why people need insects. 2. Examine how many pests that bother humans could be controlled to a greater degree with alternative methods other than chemicals that persist in the environment.

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<p>Unit 4: Pest vs. Pal</p> <p>Lesson 2: Worm’s World</p> <p>* To recognize the importance of the interrelationships among plants, animals, minerals, and people in an ecosystem. * To identify human and non-human factors that might change an ecosystem. * To appreciate the life of earthworms and gain a better understanding about other living things with which we share the Earth. * To communicate understanding of a balanced ecosystem of soil and earthworms by writing an expository piece on the importance of worms. (SCI, LA)</p>	<p>SCI/E2 – Ecosystems Students describe ways organisms depend upon, interact within, and change the living and non-living environment as well as ways the environment affects organisms.</p> <p>b. Describe that organisms all over the Earth are living, dying, and decaying and new organisms are being produced by the old ones.</p> <p>c. Explain how organisms can affect the environment in different ways.</p> <p>LA/E1 - Listening Students apply active listening skills.</p> <p>c. Follow multi-step oral instructions.</p> <p>LA/B1 – Writing Students use a writing process with an emphasis on the development of a central idea, for a variety of audiences and purposes.</p>	<p>W-6 Informational Writing: Reports, Procedures, or Persuasive Writing- Organizing Information</p> <p>W–4–6.1 Grouping ideas logically (e.g., predictable categories, steps of a procedure, reasons/arguments)</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Living things have different structures and behaviors that allow them to meet their basic needs.</p> <ul style="list-style-type: none"> – Plants need air, water and sunlight to survive. 	<ol style="list-style-type: none"> 1. Conduct observations, record results, and draw conclusions on the work of worms in our ecosystem. 2. Describe the body parts of a worm, and label them on a diagram. 3. Construct an expository piece the worm’s work of composting. 	<ol style="list-style-type: none"> 1. Identify and describe how worms create nutrient rich compost from biodegradable refuse. 2. Investigate how earthworms are beneficial to the environment. 3. Appreciate the life of earthworms and their importance to Earth. 4. Recognize that cooperative behavior is involved in successful ecosystems

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<p>Unit 4: Pest vs. Pal</p> <p>Lesson 3: Insectivores</p> <p>* To identify creatures that biologically control insects. * To understand how insects' biotic potential, their ability to reproduce at incredible rates, can be controlled by insectivorous animals. (SCI, Math)</p>	<p>SCI/A1 – Systems Students explain interactions between parts that make up whole man-made and natural things. a. Give examples that show how individual parts of organisms, ecosystems or man-made structures can influence on another. b. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing.</p> <p>MA/A1 - Numbers Students understand and use number notation to ten million in numerals. A3 – Students understand and use procedures to multiply and divide whole numbers by two-digit numbers.</p> <p>LA/A1 – Reading Students read and draw conclusions from texts within a grade appropriate span of text complexity, by applying their knowledge and strategies of comprehension, vocabulary, alphabets, and fluency.</p>	<p>R-3-4: Demonstrates initial understanding of elements of literary texts by...</p> <ul style="list-style-type: none"> R-3-4.2 Paraphrasing or summarizing key ideas/plot, with events sequenced as appropriate to text. <p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by..</p> <ul style="list-style-type: none"> R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships). 	<p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.</p>	<ol style="list-style-type: none"> Observe and write, speak or draw about similarities and differences between humans and shrews. Infer from direct observation and print or electronic information the magnitude of the numbers of insects eaten by bats. Sort and classify creatures that eat large numbers of insects. 	<ol style="list-style-type: none"> Recognize what creatures are insectivorous. Evaluate the effectiveness of creatures that some consider pests at helping to control insect populations. Understand nature provides many natural predators to control pest populations.

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<p>Unit 4: Pest vs. Pal</p> <p>Lesson 4: Six Bugs You Will Learn To Love</p> <p>* To recognize that in many cases, insects provide benefits to humans rather than cause problems for humans. * To understand that some potential benefits of insects to humans have not yet been recognized. * To understand that humans must become more familiar with the insect world before destroying it. (SCI, LA)</p>	<p>MA/B2 – Data Analysis -</p> <ol style="list-style-type: none"> Students collect and represent data in tables, diagrams, line plots, and bar graphs, and read and interpret these types of data displays. Students are able to count, order and sort objects by their properties <p>SCI/A1 – Systems Students explain interactions between parts that make up whole man-made and natural things.</p> <ol style="list-style-type: none"> Give examples that show how individual parts of organisms, ecosystems or man-made structures can influence on another. Explain ways that things including organisms, ecosystems, or man-made structures may not work as well (or at all) if a part is missing. <p>LA/A1 – Reading Students read and draw conclusions from texts within a grade appropriate span of text complexity, by applying their knowledge and strategies of comprehension, vocabulary, alphabetics, and fluency.</p>	<p>R-3-4: Demonstrates initial understanding of elements of literary texts by...</p> <ul style="list-style-type: none"> R-3-4.2 Paraphrasing or summarizing key ideas/plot, with events sequenced as appropriate to text. <p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by.</p> <ul style="list-style-type: none"> R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships). 	<p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>All organisms cause changes in the environment where they live. Some of these changes are detrimental to the organism or other organisms, whereas others are beneficial.</p>	<ol style="list-style-type: none"> Observe and write, speak or draw about the characteristics of a beneficial bug. Create a bug biography for each of the “bizarre bugs” presented. Compose and perform a play, skit, or song to perform to educate others about the many benefits of insects. Understand that without creatures like presented in this lesson, the insect population would overrun the earth. 	<ol style="list-style-type: none"> Recognize that many insects provide benefits to humans rather than cause problems for humans. Investigate the unique beneficial aspects of insects that help us to appreciate the goals of IPM. Understand nature provides many natural predators to control pest populations.
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<p>Unit 4: Pest vs. Pal</p> <p>**Lesson 5: An Ounce of Prevention</p> <p>* To become aware of the measures to be taken to avoid lice infestations. * To develop a better understanding of the treatment for head lice. * To understand that head lice can become resistant to chemical solutions. (SCI, LA)</p>	<p>SCI/B1 Skills and Traits of Scientific Inquiry Students conduct and communicate results of simple investigations.</p> <p>a. Ask questions and make observations about objects, organisms, and events in the environment. d. Know what constitutes evidence that can be used to construct a reasonable explanation. e. Use writing, speaking, and drawing to communicate investigations and explanations.</p> <p>LA/B3 – Argument/Analysis Students write to identify and explain a position to an identified audience.</p> <p>a. Summarize, compare and contrast information from reading, listening, or viewing.</p>	<p>R-3-4: Demonstrates initial understanding of elements of literary texts by...</p> <ul style="list-style-type: none"> R-3-4.2 Paraphrasing or summarizing key ideas/plot, with events sequenced as appropriate to text. <p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by..</p> <p>R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships).</p>	<p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>Many characteristics of an organism are inherited from the parents of the organism, but other characteristics result from an individual's interactions with the environment.</p>	<ol style="list-style-type: none"> Compare and contrast two pests and the wisdom of chemical vs. mechanical treatment of lice infestations. Work together to create lice prevention posters to guide others in the prevention of lice infestation. Tally, organize, and report data to the group following their insect research to discuss the problem and solutions for pests that plague humans. 	<ol style="list-style-type: none"> Understand that social behavior can help or hinder the spread of lice. Understand nature provides many natural predators to control pest populations. Explain how different organisms can develop resistance to chemicals used against them.

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<p>Unit 5: Pest Control</p> <p>Section 1: Biological/Natural</p> <p>Lesson 1: Butterflies, Mealworms, and Beetlemania</p> <p>* To determine the steps involved in complete and incomplete metamorphosis. * To recognize that biological controls (natural enemies) may be used to control targeted pests. * To understand that care must be taken when selecting a biological control to ensure that only the targeted pest will be attacked by the introduced species. (SCI, Art)</p>	<p>SCI/B1 Skills and Traits of Scientific Inquiry Students conduct and communicate results of simple investigations.</p> <p>a. Ask questions and make observations about objects, organisms, and events in the environment. b. Safely conduct simple investigations to answer questions. c. Use simple instruments with basic units of measurement to gather data and extend the senses. d. Know what constitutes evidence that can be used to construct a reasonable explanation. e. Use writing, speaking, and drawing to communicate investigations and explanations.</p> <p>Math/Data – Students are able to count, order and sort objects by their properties.</p>	<p>Data, Statistics, and Probability</p> <p>M(DSP)–3–1 Interprets a given representation (line plots, tally charts, tables, or bar graphs) to answer questions related to the data, to analyze the data to formulate conclusions, or to make predictions. M(DSP)–3–3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M(DSP)–3–1.</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>An n organism’s patterns of behavior are related to the nature of that organism’s environment,, including the kinds and numbers of other organisms present, the availability of food and resources, and the physical characteristics of the environment.</p>	<ol style="list-style-type: none"> 1. Determine the steps involved in complete and incomplete metamorphosis. 2. Observe caterpillars and mealworms as they change from eggs to adults, record the results, and evaluate the process. 3. Create a metamorphosis chart complete with accurate drawings that include all appropriate details. 	<ol style="list-style-type: none"> 1. Investigate the three stages of incomplete metamorphosis and the four stages of complete metamorphosis. 2. Understand that sometimes when scientific studies haven’t been conducted, natural controls attack not only the targeted pest, but non-targeted organisms as well. 3. Demonstrate how utilizing biological sources successfully manages pests.

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<p>Unit 5: Pest Control</p> <p>Section 1: Biological/Natural</p> <p>**Lesson 2: The Solution, or Part of the Problem</p> <p>* To determine the potential danger of indiscriminate biological control use (SCI)</p>	<p>Math/Data – Students are able to count, order and sort objects by their properties.</p> <p>SC/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work. a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p>	<p>W-6 Informational Writing: Reports, Procedures, or Persuasive Writing- Organizing Information W–4–6.1 Grouping ideas logically (e.g., predictable categories, steps of a procedure, reasons/arguments)</p> <p>Data, Statistics, and Probability M(DSP)–3–1 Interprets a given representation (line plots, tally charts, tables, or bar graphs) to answer questions related to the data, to analyze the data to formulate conclusions, or to make predictions. M(DSP)–3–3 Identifies or describes representations or elements of representations that best display a given set of data or situation, consistent with the representations required in M(DSP)–3–1.</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry <p>Understanding about scientific inquiry</p>	<ol style="list-style-type: none"> 1. Recognize the potential problems of careless control selection. 2. Prepare a graph to illustrate the impact of an introduced species on native species. 3. Develop an original game or simulation that illustrates the potential problem of introduced species. 	<ol style="list-style-type: none"> 1. Demonstrate how utilizing biological sources successfully manages pests. 2. Understand that unless potential biological controls are screened carefully, they may pose a potential danger to native species.

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<p>Unit 5: Pest Control</p> <p>Section 2: Chemical</p> <p>**Lesson 1: DDT – Doing Deadly Things</p> <p>* To determine the impact of chemical pesticides in a habitat. * To visually demonstrate an understanding of the negative effects pesticides have on the ecosystem. (SCI, LA, Math, Art)</p>	<p>LA/B4 – Writing Students write to persuade a targeted audience. a. Establish a clear position on a topic and support the position with relevant evidence.</p> <p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work. a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p>	<p>R-3-4: Demonstrates initial understanding of elements of literary texts by...</p> <ul style="list-style-type: none"> R-3-4.2 Paraphrasing or summarizing key ideas/plot, with events sequenced as appropriate to text. <p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by..</p> <p>R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships).</p>	<p>Life Science</p> <ul style="list-style-type: none"> Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> The characteristics of organisms Life cycles of organisms Organisms and Environments <p>Science as Inquiry</p> <ul style="list-style-type: none"> Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> Abilities necessary to do scientific inquiry Understanding about scientific inquiry. 	<ol style="list-style-type: none"> Investigate the “domino effect” that spraying the chemical pesticide dieldrin has by using a set of real dominoes to demonstrate the physical action of cause and effect. Create a billboard to raise awareness about the harmful effects of using chemical pesticides in a local ecosystem. Debate the pros and cons of organic versus chemical insect controls. 	<ol style="list-style-type: none"> Understand that predator/prey relationships can be permanently disrupted when the food chain is impacted by toxic poisons building up. Recognize that chemical pesticides such as DDT persist in the environment and become concentrated in unexpected, undesirable places.

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<p>Unit 5: Pest Control</p> <p>Section 2: Chemical</p> <p>Lesson 2: Easy To Do, But Dangerous Too!</p> <p>* To understand the dangers and negative effects of using chemicals to control pests. (SCI, Art)</p>	<p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources</p> <p>a. Follow an established procedure for locating sources appropriate to reading level. b. Collect information for a specific purpose. c. Organize findings. d. Share information gathered using oral and visual examples.</p> <p>SCI/B1 Skills and Traits of Scientific Inquiry Students conduct and communicate results of simple investigations.</p> <p>a. Ask questions and make observations about objects, organisms, and events in the environment. b. Safely conduct simple investigations to answer questions.</p>	<p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by...</p> <p>R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships).</p> <p>W-6 Informational Writing: Reports, Procedures, or Persuasive Writing- Organizing Information W-4-6.1 Grouping ideas logically (e.g., predictable categories, steps of a procedure, reasons/arguments)</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Humans depend on their natural and constructed environments. Humans change environments in ways that can be either beneficial or detrimental for themselves and other organisms.</p>	<ol style="list-style-type: none"> 1. Understand that even though pesticides are part of pest management how detrimental to the environment chemical controls can be. 2. Illustrate the effects of chemicals on the environment through the creation of a mural. 	<ol style="list-style-type: none"> 1. To understand that chemical powders and sprays applied to get rid of pests can harm land, water, plants, and animals including people.

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<p>Unit 5: Pest Control</p> <p>Section 3: Social/Cultural</p> <p>**Lesson 1: Of Loraxes and Wumps</p> <p>* To recognize that man’s activities impact the natural environment. * To recognize the theme of a fictional piece. * To understand how fiction reflects truth. (SCI, LA)</p>	<p>LA/A2 – Literary Texts Students read fiction within a grade appropriate span of text complexity.</p> <p>a. Make inferences about characters’ actions and explain how their behaviors affect the theme. b. Identify and define the function of figurative language and the use of literary devices.</p> <p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work.</p> <p>a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p>	<p>R–5–5: Analyze and interpret elements of literary texts, citing evidence where appropriate by...</p> <p>• R–5–5.5 Identifying author’s message or theme (implied or stated, as in a fable)</p> <p>R-3-5: Analyze and interpret elements of literary texts, citing evidence where appropriate by...</p> <p>R-3-5.3 Making basic inferences about problem, conflict, or solution (e.g. cause-effect relationships).</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments 	<ol style="list-style-type: none"> 1. Create a poster urging people to use methods other than chemicals to control pests. 2. Utilize appropriate vocabulary learned to explain the various alternative IPM methods for pest control. 3. Understand how fiction can reflect truth. 4. Conduct an experiment to evaluate the degree of pollution based on data collected. 	<ol style="list-style-type: none"> 1. Understand that we share the environment with other living things and depend on them to live. 2. Explain that IPM applies the most environmentally sound methods to pest management.

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<p>Unit 5: Pest Control</p> <p>Section 4: Mechanical</p> <p>Lesson 1: To Catch a Leprechaun</p> <p>* To investigate the criteria for a successful trap. * To design and create a trap with a younger child. (SCI, LA)</p>	<p>LA/B5 – Writing Students write letters, other requests for information or directions for completing a process. b. Write multi-step directions for completing a task.</p> <p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work. a. Describe how scientific investigations involve asking and answering a question. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p>	<p>Not applicable to this activity.</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Earth and Space Science</p> <ul style="list-style-type: none"> • Content Standard D: As a result of their activities in grades K-4, all students should develop an understanding of <ul style="list-style-type: none"> ○ Properties of earth materials ○ Objects in the sky ○ Changes in earth and sky 	<ol style="list-style-type: none"> 1. List the important criteria for trapping a creature. 2. Be a mentor for a younger child, and explain their goal to build a leprechaun trap. 3. Create a successful leprechaun trap. 	<ol style="list-style-type: none"> 1. Understand that using chemicals to control pests should not be our first choice in pest control. 2. Investigate how traps are a mechanical device used in IPM for pest control.

**Department of Agriculture Integrated Pest Management
Maine Curriculum Alignment: Grade 4 and Grade 5**

<i>Unit / Lesson</i>	<i>Maine State Learning Results (Grades 3-5) Performance Indicators and Descriptors</i>	<i>New England Common Assessment Program Grade Level Expectations</i>	<i>National Science Education Content Standards</i>	<i>Grade-Level Expectations Students should be able to:</i>	<i>Assessment Standards</i>
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<p style="text-align: center;">Unit 6: Summary</p> <p style="text-align: center;">Lesson 1: The Choice is Yours</p> <p>* To identify environmental problems that impact people, plants, and wildlife. * To distinguish between actions that are harmful and beneficial to the environment. * To understand how all living things are affected by damage to natural habitats and ecosystems. * To identify ways to reduce the “Ecological Footprint” humans leave on the Earth. * To evaluate the possibility of making changes in behaviors related to the environment. (SCI, LA, SS)</p>	<p>LA/C1 - Research Students answer research questions by gathering information from print and non-print sources b. Collect information for a specific purpose. c. Organize findings. d. Share information gathered using oral and visual examples.</p> <p>SCI/C1 – Understandings of Inquiry Students describe the use of questions and accurate communication in scientists’ work. b. Point out the importance of describing things and investigations accurately so others can learn about them or repeat them.</p> <p>LA/B4 – Persuasive Students write to persuade a targeted audience. a. Establish a clear position on a topic and support the position with relevant evidence.</p>	<p>R–3–3: Shows breadth of vocabulary knowledge through demonstrating understanding of word meanings or relationships by ...</p> <p>• R–3–3.2 Selecting appropriate words to use in context, including content specific vocabulary (e.g., predator/prey), or words with multiple meanings)</p>	<p>Life Science</p> <ul style="list-style-type: none"> • Content Standard C: As a result of activities in grades K-4, all students should develop understanding of: <ul style="list-style-type: none"> ○ The characteristics of organisms ○ Life cycles of organisms ○ Organisms and Environments <p>Science as Inquiry</p> <ul style="list-style-type: none"> • Content Standard A: As a result of activities in grades K-4, all students should develop: <ul style="list-style-type: none"> ○ Abilities necessary to do scientific inquiry ○ Understanding about scientific inquiry. 	<ol style="list-style-type: none"> 1. Hypothesize and design a plan to reduce a person’s ecological footprint. 2. Develop a survey to use to interview people in the community to identify environmental problems. 3. Publish a brochure that shows the results of the surveys and make it available to the community. 4. Utilize appropriate vocabulary learned to explain the various alternative IPM methods for pest control. 	<ol style="list-style-type: none"> 1. Understand that the earth and its entire species are threatened by habitat loss, introduced species, pollution, population growth, and over-consumption of the planet’s resources. 2. Remember that to reduce the stress on the planet, we can conserve resources, create less waste practice IPM, and join community groups that conserve, reduce, reuse, and recycle earth’s abundant resources.
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