



Performance Task: Integrated Pest Management



PART 1: Research

Student Directions:

Your Assignment:

Pest management is a critical problem for Washington State farmers. These farmers must balance pest control with environmental concerns regarding the use of pesticides. A popular solution to this dilemma is an approach called *Integrated Pest Management*. Your job is to educate people in the community about this approach so that they can practice IPM in their own gardens and advocate for its use in farming practices. You will watch videos, read articles, and view pictures and diagrams to build your knowledge base. Then you will answer several research questions prior to writing your essay.

Steps You Will Follow:

To plan and write your essay, you will do all the following:

1. Watch three videos.
2. Read two articles.
3. View two posters.
4. Answer three questions about the readings and the videos.
5. Plan and write your essay.

Directions for Beginning:

You will now watch the videos and read the articles and posters. Take notes because you will want to refer to your notes while answering the three research questions and writing your essay. You may refer to any of the sources as often as you like.

Source Information:

Video #1: *What is Integrated Pest Management (2:13)*

<https://youtu.be/FXT-5qcDkRY>

Video #2: *Integrated Pest Management IPM Basics (5:54)*

<https://youtu.be/mLaZvS5gEic>

Video #3: *IPM in Agriculture (4:14)*

https://youtu.be/fzN_CJuSF8Q

Articles: #1: Q&A: United States Environmental Protection Agency

#2: Integrated Pest Management: American Farmland Trust

Posters: #1: *What is IPM?* Rutgers Univ. and the NE Center for Rural Development

#2: *IPM Pyramid:* USDA Agricultural Research Library, Sidney, Montana



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Researching Integrated Pest Management

NOTE TAKING TOOL

SOURCE	Defining Integrated Pest Management	How IPM Works: Strategies	Benefits of IPM
Video #1: Potato Farmer Explaining IPM			
Video #2: IPM: A Common Sense Approach			



Performance Task: Integrated Pest Management



NOTE TAKING TOOL

SOURCE	Defining Integrated Pest Management	How IPM works: Strategies	Benefits of IPM
Video #3: Five steps to Integrated Pest Management			



Performance Task: Integrated Pest Management



NOTE-TAKING TOOL

SOURCE	Defining Integrated Pest Management	How IPM works: Strategies	Benefits of IPM
Article #1: Q&A: United States Environmental Protection Agency			
Article #2: Integrated Pest Management: American Farmland Trust			



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NOTE TAKING TOOL

SOURCE	Defining Integrated Pest Management	How IPM works: Strategies	Benefits of IPM
Poster #1: <i>What is IPM?</i> Rutgers Univ. and the NE Center for Rural Development			
Poster #2: <i>IPM Pyramid:</i> USDA Agricultural Research Library, Sidney, Montana			

Q and A

Integrated Pest Management



1. What is IPM?

Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment. The IPM approach can be applied to both agricultural and non-agricultural settings, such as the home, garden, and workplace. IPM takes advantage of all appropriate pest management options including, but not limited to, the judicious use of pesticides. In contrast, *organic* food production applies many of the same concepts as IPM but limits the use of pesticides to those that are produced from natural sources, as opposed to synthetic chemicals.

2. How do IPM programs work?

IPM is not a single pest control method but, rather, a series of pest management evaluations, decisions and controls. In practicing IPM, growers who are aware of the potential for pest infestation follow a four-tiered approach. The four steps include:

Step #1: Set Action Thresholds

Before taking any pest control action, IPM first sets an action threshold, a point at which pest populations or environmental conditions indicate that pest control action must be taken. Sighting a single pest does not always mean control is needed. The level at which pests will either become an economic threat is critical to guide future pest control decisions.

Step #2: Monitor and Identify Pests

Not all insects, weeds, and other living organisms require control. Many organisms are innocuous, and some are even beneficial. IPM programs work to monitor for pests and identify them accurately, so that appropriate control decisions can be made in conjunction with action thresholds. This monitoring and identification removes the possibility that pesticides will be used when they are not really needed or that the wrong kind of pesticide will be used.

Step #3: Prevention

As a first line of pest control, IPM programs work to manage the crop, lawn, or indoor space to prevent pests from becoming a threat. In an agricultural crop, this may mean using cultural methods, such as rotating between different crops, selecting pest-resistant varieties, and planting pest-free rootstock. These control methods can be very effective and cost-efficient and present little to no risk to people or the environment.

continued

How do IPM programs work?

Step #4: Control

Once monitoring, identification, and action thresholds indicate that pest control is required, and preventive methods are no longer effective or available, IPM programs then evaluate the proper control method both for effectiveness and risk. Effective, less risky pest controls are chosen first, including highly targeted chemicals, such as pheromones to disrupt pest mating, or mechanical control, such as trapping or weeding. If further monitoring, identifications and action thresholds indicate that less risky controls are not working, then additional pest control methods would be employed, such as targeted spraying of pesticides. Broadcast spraying of non-specific pesticides is a last resort.

3. Do most growers use IPM?

With these steps, IPM is best described as a continuum. Many, if not most, agricultural growers identify their pests before spraying. A smaller subset of growers uses less risky pesticides such as pheromones. All of these growers are on the IPM continuum. The goal is to move growers further along the continuum to using all appropriate IPM techniques.

4. How do you know if the food you buy is grown using IPM?

In most cases, food grown using IPM practices is not identified in the marketplace like organic food. There is no national certification for growers using IPM, as the United States Department of Agriculture has developed for organic foods. Since IPM is a complex pest control process, not merely a series of practices, it is impossible to use one IPM definition for all foods and all areas of the country. Many individual commodity growers, for such crop as potatoes and strawberries, are working to define what IPM means for their crop and region, and IPM-labeled foods are available in limited areas. With definitions, growers could begin to market more of their products as IPM-Grown, giving consumers another choice in their food purchases.

5. If I grow my own fruits and vegetables, can I practice IPM in my garden?

Yes, the same principles used by large farms can be applied to your own garden by following the four-tiered approach outlined above. For more specific information on practicing IPM in your garden, you can contact your state Extension Services for the services of a Master Gardener.



Source: The Environmental Protection Agency

Integrated Pest Management

[Our Environmental Solutions](#)

[Our Work in the Field](#)

[Conservation Tools and Practices](#)

We are helping farmers find new ways to comply with expanded regulations through integrated pest management (IPM).

Working with the U.S. Environmental Protection Agency, we've managed small grants programs since 1997 that have helped 11,000 producers on 720,000 acres reduce their use of highly toxic pesticides by 30 to 50 percent while remaining profitable. **As a result of this partnership, pesticide use has been reduced by more than 2 million pounds.**

AFT supports the adoption of IPM programs as a crucial step toward improving environmental stewardship on the farm. The focus of IPM programs on maintaining profits while protecting human health and the environment contributes to the long-term viability of farms and makes it more likely that farmland will remain in agriculture.



What is Integrated Pest Management?

Since the 1970's, researchers have been exploring safer, more ecologically sound ways to manage pests. IPM is a sustainable approach to pest management that draws from a variety of disciplines. It combines biological, cultural, physical and chemical tools in ways that minimize economic, health and environmental risks.

Pests can include insects, rodents, plant diseases, weeds and nematodes. Methods of control range from reinforcing a pest's natural enemies to disrupting a pest's life cycle, careful weather monitoring and scouting. If necessary, pesticides are also used, but only those that do not harm the environment. Although IPM programs vary on a crop-by-crop and region-by-region basis, key principles include:

- **Prevention** — using practices like good sanitation or eliminating alternate pest hosts to keep pest populations from infesting a crop or field in the first place;
- **Avoidance** — using cultural techniques like timing of planting or rotating crops to avoid losses to pests that could be present in a field;
- **Monitoring** — observing pest populations, weather and nutrients to make sound treatment decisions; and
- **Suppression** — using cultural, physical, biological or pesticidal means to suppress pest populations so that they don't reach damaging levels.

Benefits of IPM

IPM has been proven to maintain or increase grower profits while positively impacting the environment and human health. IPM typically reduces the use of highly toxic pesticides and fertilizer. Increased crop yields, decreased soil erosion and increased profits are just some of the rewards farmers can expect when they implement wise management practices. Other environmental benefits of IPM include:

- Protecting the natural resource base
- Protecting wildlife, beneficial insects and endangered species
- Preventing the degradation of soil, water, and air quality
- Ensuring a safe supply of agricultural products
- Safeguarding the health of agricultural workers and their families

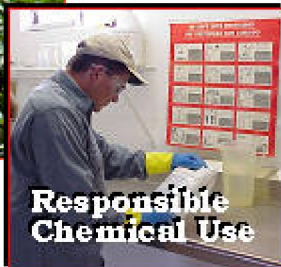
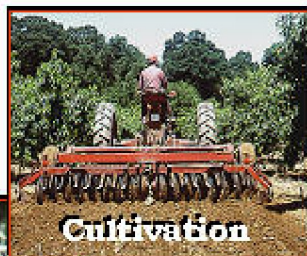
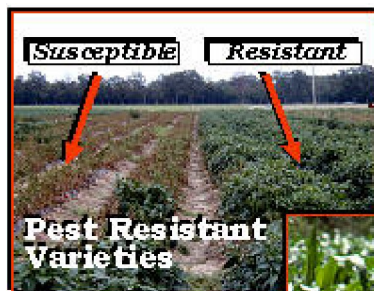
You can learn more about IPM by visiting [USDA's four regional IPM Centers](#). The regional centers have collected examples from around the country of ways that IPM pays off for farmers.

WHAT IS IPM?

Farmers use

Integrated Pest Management (IPM) strategies to prevent crop damage from - insect, weed, and disease pests.

IPM PRACTICES INCLUDE:



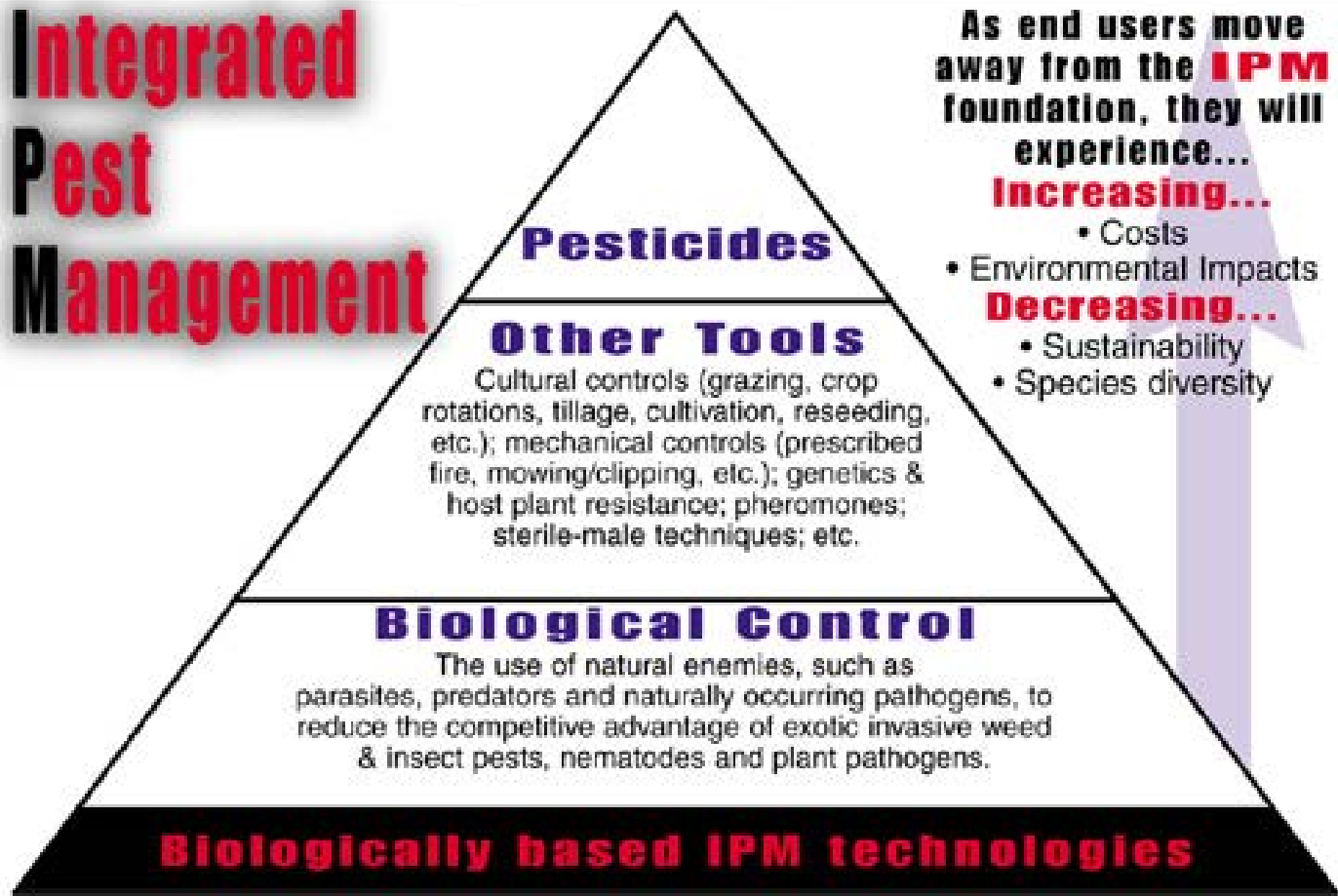
WHY SHOULD YOU CARE?

Because IPM practices help farmers:

- conserve our environment.
- produce quality crops.
- maintain farm profitability.



Integrated Pest Management



Attitudes about controlling exotic invasive weed and insect pests, nematodes and plant pathogens are changing. Ecological considerations are more important than ever before, and concerns about pesticide use are increasing.

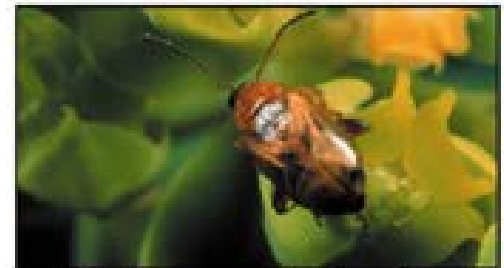
Pesticides have historically been the foundation of the pest control pyramid – it was the tool everyone started with, the tool other efforts revolved around.

But the control pyramid is changing, and alternate methods of controlling weed and insect pests, nematodes and plant

pathogens are being sought out and used. Pesticides are still the choice for containment, short-term relief and situations where other tools are ineffective, but biologically based strategies are now considered the foundation upon which to build.

Integrated Pest Management combines ecologically sound strategies with other tools to provide better control and more flexibility than could be achieved by using any single tool alone. **Affordability, effectiveness, flexibility** and **sustainability** are key components of IPM – the preferred pest management tool of the new millennium.

This information is provided to you by TEAM Leafy Spurge and the USDA-ARS Northern Plains Agricultural Research Laboratory in Sidney, Montana.



Aphthona spp. flea beetle on leafy spurge.



Root damage to leafy spurge caused by Aphthona spp. flea beetle larvae.



Task: Integrated Pest Management



2. You have been asked to explain IPM to students at a neighboring school. You can use one video, one article, and one poster. Which sources do you select and what is your criteria? *(Claim 4, Target 3)*



Task: Integrated Pest Management



3. Defend the following statement: *Integrated Pest Management is a common sense approach to pest control.* Use information from multiple sources in your response citing the sources you use.
(Claim 4, Target 4)



Performance Task: Integrated Pest Management



Part 2: Field Investigation

Students can plan and plant a school or community garden, practicing integrated pest management techniques. They can keep a journal, recording the growth of the plants and how the practices are working to keep the garden healthy. They can also visit a farm where these practices are in effect, making observations and interviewing the farmer.

Discussion questions might include the following:

- What do we mean by integrated pest management?
- How do IPM practices impact the environment?
- What barriers exist to using IPM practices?
- How are farmers in Washington State adopting the IPM practices?

In addition, teachers may want to consider one or more of the following field investigations:

- PLT- Biodiversity Module-Activity 3: Potatoes, Pesticides, and Biodiversity:
<https://www.plt.org/blog/activity/biodiversity-activity-3-potatoes-pesticides-biodiversity/>

Other ideas for field investigations:



Performance Task: Integrated Pest Management



Part 3: Essay

Student Directions:

You will now review your notes and sources, plan, draft, and revise your essay. You may use your notes from day 1 and refer to the sources. Now read your assignment and the information about how your essay will be scored. Then begin your work.

Your assignment:

You have been asked to educate the people in your community about Integrated Pest Management as a preferred approach to farming and home gardening. In your essay, explain what Integrated Pest Management is, how it works and why it is a preferred method of pest control. Your goal is for all community members to understand and apply this method of pest control to their own gardens. Use information from both print and video sources in your essay making sure that you reference the sources that you use.

Essay Scoring

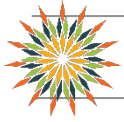
Your essay will be scored on the following criteria:

- 1. *Statement of Purpose/Focus*** – how well you clearly state and maintain your focus? How well did your ideas logically flow from the introduction to conclusion using effective transitions? How well did you stay on topic throughout the article?
- 2. *Elaboration of Evidence*** – how well did you provide evidence from the sources to support your opinions? How well did you elaborate with specific information from the sources you reviewed? How well did you effectively express ideas using precise language that was appropriate for your audience and purpose?
- 3. *Conventions*** – how well did you follow the rules of usage, punctuation, capitalization, and spelling?

Now begin work on your essay.

Manage your time carefully so that you can:

- plan your essay.
- write your essay.
- revise and edit for a final draft.



Performance Task: Integrated Pest Management



Planning My Essay

Essay Components
Introduction: Capture the reader's attention
Statement of purpose or controlling idea:
What Integrated Pest Management is:
How Integrated Pest Management works:
Why home gardeners should consider using Integrated Pest Management:
Conclusion:

Informative / Explanatory Writing Rubric (Grades 6-11)

Scoring Version



Score	4	3	2	1
Statement of Purpose/Focus	<p>The response is fully sustained and consistently and purposefully focused:</p> <ul style="list-style-type: none"> consistent or main idea of a topic is clearly communicated, and the focus is strongly maintained for the purpose, audience, and task 	<p>The response is adequately sustained and generally focused:</p> <ul style="list-style-type: none"> controlling or main idea of the topic is clear, and the focus is mostly maintained for the purpose, audience, and task 	<p>The response is somewhat sustained and may have a minor drift in focus:</p> <ul style="list-style-type: none"> controlling or main idea of a topic may be somewhat unclear, and the focus may be insufficiently sustained for the purpose, audience, and task 	<p>The response may be related to the topic but may provide little or no focus:</p> <ul style="list-style-type: none"> controlling or main idea of the topic may be somewhat confusing or ambiguous; response may be too brief or the focus may drift from the purpose, audience, and task
Organization	<p>The response has a clear and effective organizational structure creating unity and completeness:</p> <ul style="list-style-type: none"> consistent use of a variety of transitional strategies to clarify the relationships between and among ideas effective introduction and conclusion logical progression of ideas from beginning to end; strong connections between and among ideas, with some syntactic variety 	<p>The response has an evident organizational structure and a sense of completeness, though there may be minor flaws and some ideas may be loosely connected:</p> <ul style="list-style-type: none"> adequate use of transitional strategies with some variety to clarify the relationships between and among ideas adequate introduction and conclusion adequate progression of ideas from beginning to end; adequate connections between and among ideas 	<p>The response has an inconsistent organizational structure, and flaws are evident:</p> <ul style="list-style-type: none"> inconsistent use of transitional strategies with little variety introduction and conclusion, if present, may be weak uneven progression of ideas from beginning to end; and/or formulaic; inconsistent or unclear connections between and among ideas 	<p>The response has little or no discernible organizational structure:</p> <ul style="list-style-type: none"> few or no transitional strategies are evident introduction and conclusion, if present, may be missing frequent extraneous ideas may be evident; ideas may be randomly ordered or have an unclear progression
Elaboration of Evidence	<p>The response provides thorough and convincing support/evidence for the controlling idea and supporting idea(s) that includes the effective use of sources, facts, and details.</p> <ul style="list-style-type: none"> comprehensive evidence from sources is integrated; references are relevant and specific effective use of a variety of elaborative techniques* 	<p>The response provides adequate support/evidence for the controlling idea and supporting idea(s) that includes the use of sources, facts, and details:</p> <ul style="list-style-type: none"> adequate evidence from sources is integrated; some references may be general adequate use of some elaborative techniques* 	<p>The response provides uneven, cursory support/evidence for the controlling idea and supporting idea(s) that includes uneven or limited use of sources, facts, and details:</p> <ul style="list-style-type: none"> some evidence from sources is weakly integrated, imprecise, or repetitive; references may be vague weak or uneven use of elaborative techniques*; development may consist primarily of source summary 	<p>The response provides minimal support/evidence for the controlling idea and supporting idea(s) that includes little or no use of sources, facts, and details:</p> <ul style="list-style-type: none"> evidence from the source material is minimal or irrelevant; references may be absent or incorrectly used minimal, if any, use of elaborative techniques*
Language	<p>The response clearly and effectively elaborates ideas, using precise language:</p> <ul style="list-style-type: none"> vocabulary is clearly appropriate for the audience and purpose effective, appropriate style enhances content 	<p>The response adequately elaborates ideas, employing a mix of precise with more general language:</p> <ul style="list-style-type: none"> vocabulary is generally appropriate for the audience and purpose generally appropriate style is evident 	<p>The response elaborates ideas unevenly, using simplistic language:</p> <ul style="list-style-type: none"> vocabulary is uneven or somewhat ineffective for the audience and purpose inconsistent or weak attempt to create appropriate style 	<p>The response is vague, lacks clarity, or is confusing:</p> <ul style="list-style-type: none"> vocabulary is limited or ineffective for the audience and purpose little or no evidence of appropriate style

Score	2	1	0
Conventions	<p>The response demonstrates a command of conventions:</p> <ul style="list-style-type: none"> adequate use of correct sentence formation, punctuation, capitalization, grammar usage, and spelling 	<p>The response demonstrates partial command of conventions:</p> <ul style="list-style-type: none"> limited use of correct sentence formation, punctuation, capitalization, grammar usage, and spelling 	<p>The response demonstrates little or no command of conventions:</p> <ul style="list-style-type: none"> infrequent use of correct sentence formation, punctuation, capitalization, grammar usage, and spelling

NS	<p>Unintelligible, in a language other than English, off-topic, insufficient evidence (incomplete) or copied text. (Off-purpose writing will still receive a score in Conventions.)</p>
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*Elaborative techniques may include the use of personal experiences that support the controlling idea.