



# INTEGRATED PEST MANAGEMENT

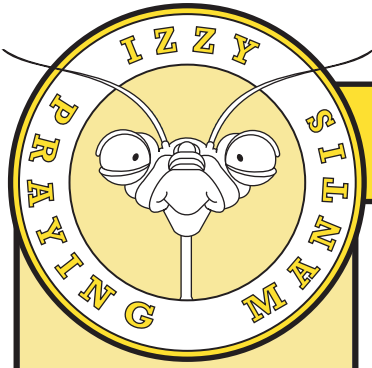
## Unit 2 Section 3 Lesson 13 Hygiene for Horror

**Focus Areas:** Pest Control Methods -  
Cultural; Social Studies, Science,  
Language Arts

**Focus Skills:** Developing historical  
perspective, understanding cause and  
effect, comparing and contrasting  
points of view, drawing conclusions

**Level of Involvement:** AVERAGE





***Dedicated  
to Reducing  
Pesticides***



**University of  
Connecticut**  
College of Agriculture  
and Natural Resources  
*Cooperative Extension System*

## Unit 2 Section 3 Lesson 13: Hygiene for Horror

**Focus Areas:** Pest Control Methods - Cultural; Social Studies, Science, Language Arts

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### Objectives

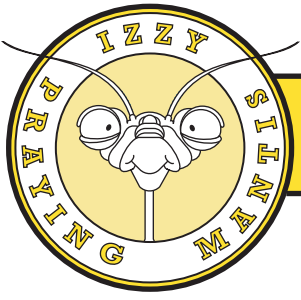
- \* To recognize that social and cultural practices can contribute to the spread of infectious disease
- \* To recognize that Integrated Pest Management (IPM) techniques contribute to the control of infectious disease

### Essential Questions

- \* What elements of medieval life style contributed to the spread of the Plague?
- \* What physical characteristics of rats and/or fleas made the rapid spread of the Plague in this social and cultural climate inevitable?
- \* What parallels can be drawn between living conditions of the Middle Ages and current lifestyles in underdeveloped countries, urban environments and rural ghettos?
- \* What IPM tactics control the spread of infectious disease?

### Essential Understandings

1. Lack of technology and scientific knowledge, coupled with care less human health practices, resulted in living conditions that were prime for the spread of infectious diseases during the Middle Ages.
2. Both fleas and rodents thrive in environments unhealthy for humans.
3. Poverty is often the partner of infectious disease. Therefore, in blighted areas infectious diseases can still be a threat.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Essential Understandings

4. Not only today, but in medieval times as well, attention to sanitation practices, i.e., removal of a pest's food and water, interruption of a pest's life cycle and destruction of pest hideouts, contributed to effective pest management.

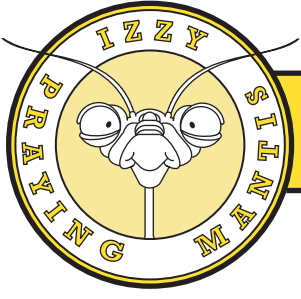


### Background

Read Handouts 1 through 4 and review Overheads 1, 2 and 3.

### Vocabulary

|                    |  |
|--------------------|--|
| <b>bacteria</b>    | single celled microorganism, chiefly parasitic or saprophytic                                  |
| <b>Black Death</b> | an outbreak of bubonic plague that was pandemic throughout Europe and Asia in the 14th century |
| <b>endemic</b>     | native to a particular people or location  |
| <b>enzootic</b>    | affecting lower orders of animals, but not humans  |
| <b>epidemic</b>    | affecting many in a community, as in a disease   |
| <b>pandemic</b>    | affecting the majority of people in one or multiple countries                                  |
| <b>pestilence</b>  | a contagious or infectious epidemic  |
| <b>plague</b>      | a malignant or contagious disease  |



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Challenge

Slow the spread of an infectious disease!

### Logistics

**Time:** depending on prior understanding, two to four blocks, 45 minutes per block

**Group size:** 3 to 30

**Space:** comfortable seating for group

### Materials



Handout 1 Bug Facts - Fleas \*

Handout 2 Bug Facts - Rats \*

Handout 3 Natural History \*



Handout 4 Fact List: Living Conditions in the Middle Ages (optional) \*

Overhead 1 The Cycle of the Black Plague \*

Overheads 2 and 3 Emerging Diseases \*

Worksheet 1 Group Planning Sheet \*



Worksheet 2 The Trashy Side of the Teen Ages \*

Article 1 The Trashy Side of the Middle Ages \*

Article 2 Global Cities Population Crisis - Why Should We Care? \*

Article 3 Cities and the Environment \*

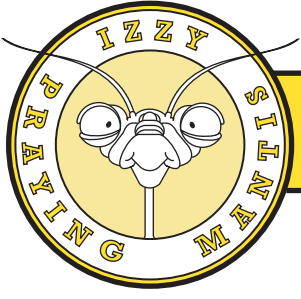
Article 4 7,000,000 Americans... The Most Ignored Poverty \*

Article 5 Risk Reduction \*

overhead projector

white/black board or chart paper

\* single copy provided



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Preparations

1. Prepare copies of Handouts 1 through 4 and articles
2. Set up overhead projector
3. Prepare area for group listing of brainstorming activity

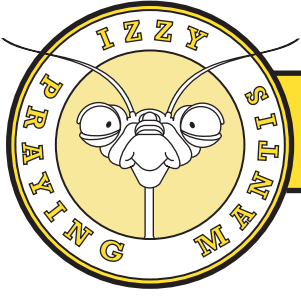
### Activity

#### Introduction

1. Ask participants to brainstorm facts about the Black Death.
2. List responses on board or chart paper (If necessary, read back ground material to group).
3. Display Overhead 1 to the group.
4. Read the article "The Trashy Side of the Middle Ages."

#### Involvement

1. Write the Challenge on the board.
2. Distribute Handouts 1 and 2 on fleas and rats and allow time to read.
  - 2a. **Option #1:** If group has studied the Middle Ages, brainstorm living conditions in this era and list on board. Ask leading questions to elicit desired information.
  - 2b. **Option #2:** If general knowledge is limited, distribute Handout 4 Fact Sheet: Living Conditions in the Middle Ages and read aloud.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

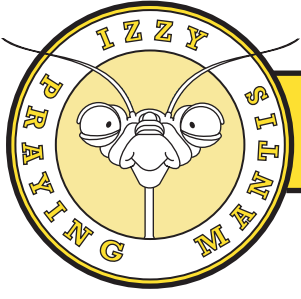
### Activity

#### Involvement (continued)

3. Divide the participants into groups of three, four or five, depending on group dynamics.
4. Display Overhead 2 and review content.
5. Direct teams to compare the pest facts to living conditions that encouraged the spread of plague.
6. Share observations and conclusions as a group.
7. In teams, develop **viable** IPM plans that could have slowed the spread of plague and complete Worksheet 1.
8. Share plans as a group.

### Follow Up

1. Distribute current articles on continuing hygienic problems in poverty stricken areas. **Note:** Not every participant need read every article, but all articles need to be read by every group.
2. Share article *Why Should We Care?*
3. As a group, compare current sanitary practices and problems to those of the Middle Ages.
4. Reexamine methods suggested by group to slow plague (Overhead 3). Would they help today? Discuss. Emphasize that sanitation is still an essential part of IPM today and is a widely used cultural method to control pests: human health pests, crop pests (diseases, insects, weeds), etc.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Answer Key

Answers will vary depending on group

### Assessment

Complete the assessment "The Trashy Side of the Teen Ages."

### Follow Through What the Experts Say

**Focus Areas:** Evaluating content

**Focus Skills:** Forming and defending an opinion

Distribute Article 5 Center for Disease Control (CDC) material from the website and discuss the effectiveness of the recommendations.

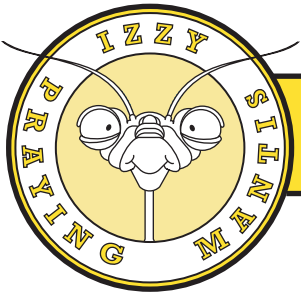
- \* Is it comprehensive?
- \* Does it focus on the problem?
- \* What could be done to improve this action plan?

### Resources



Bagdikian. 1964. Beacon Press. *In the Midst of Plenty*.

Pearson, Ridley. Hyperion. 1998. *Pied Piper*.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Resources



**Multiple Websites on plague and the Medieval Era: Choose any Search Engine**

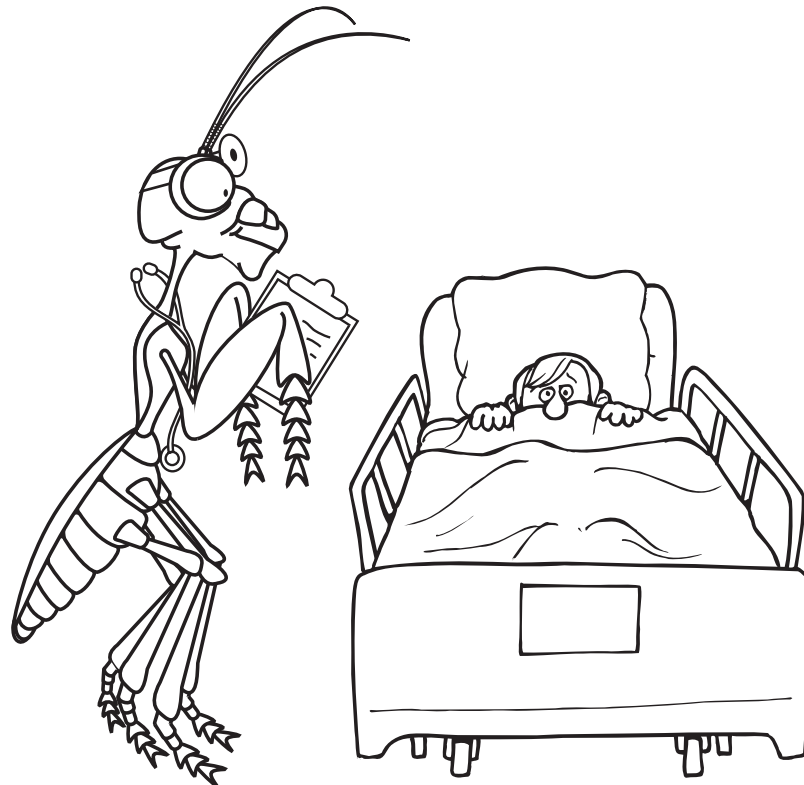
**Websites on poverty and urban blight**

Burge Pest Control. Rats and Fleas.  
<http://www.burgepest.com/burge/bugfacts.html>

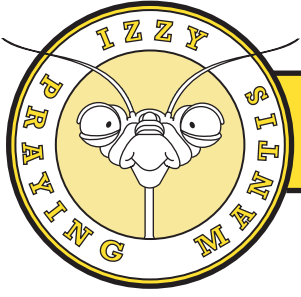
CDC Division of Vector-Borne Infectious Diseases  
<http://www.cdc.gov/ncidod/dvbid/plague/history.htm>

Urban Growth. World Resources Institute Global Trends  
<http://www.wri.org/trends/index.html>

Yordy, John S., Emerging Infectious Diseases. College of Medicine.  
Humanitas Medical University, South Carolina. Vol III Spring 1999.  
<http://www.edserv.musc.edu/humanitas3/diseases.htm>







## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Notes



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Bug Facts - Fleas

#### Handout 1

- \*There are about 2,250 species of fleas.
- \* Fleas are small, wingless, brown to black, blood sucking insects.
- \* Fleas have flattened bodies with spines that are aimed backwards. This enables them to move rapidly and efficiently through the body hair of an animal.
- \*They have piercing-sucking mouthparts that are somewhat like a siphon .
- \* Fleas can jump 7 - 8 vertically and 14 - 16 horizontally which is 20 times their own height. The equivalent of a 6 foot man jumping 120 feet.
- \* Flea larvae have been observed to burrow to a maximum depth of 1/2 inch.
- \* Flea larvae will crawl several inches to reach cover and escape bright light and feed on dried fecal blood.
- \*The adult flea will spend 99% of its life on a host animal but eggs fall off and thereby spread infestation. Fleas resting in their cocoons come out in response to vibration from vacuum cleaners, people or pets moving about.
- \*The flea's life cycle is egg, larvae, pupae, and adult. The time required to complete a cycle depends on temperature, humidity, and the food available to the developing insect.
- \*The female flea can lay 300 to 500 eggs in her lifetime. Flea eggs are about 1/50th of an inch in length. Flea eggs hatch in 1-6 days and fleas can develop from egg to adult in 17-21 days.
- \*The female mates only once, she lays her eggs loose on the host animal and must have a blood meal before she can lay fertile eggs.
- \*The adult flea can live up to 20 weeks in the pupa case.
- \* Flea larvae stay very near the surface to be close to their food supply-adult flea feces and other animal derived material.
- \* Flea larvae primary food is feces of the adult flea, but will feed on other materials such as pet dander, flea eggs, injured larvae, and proglottids- the shed body segments of the dog and cat tapeworm.
- \* Adult fleas can live for months without food.
- \* Fleas can carry Bubonic Plague and Murine Typhus. Some fleas, especially those from squirrels in the Sierras, still carry The Plague.
- \* About 75% of fleas are associated with rodents.
- \* Fleas require a complete 3-step treatment in order to effectively eliminate the entire population.
  1. The entire yard is treated with special attention spent on the areas fleas are likely to occur such as shady vegetation under decks where animals rest.
  2. The interior of the home is treated with a combination of residual materials and Insect Growth Regulators.
  3. Pet treatments to prevent reinfestation of the animal and home.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Bug Facts - Rats

#### Handout 2

- \* Rats will live for 6 to 12 months and are sexually mature at 2-3 months.
- \* Female rats produce an average of 4-7 litters per year and 8-12 young per litter.
- \* For self defense, rats are nocturnal and become active after a premises has become quiet, or about one 1/2 hour after dusk. When left alone they will roam around day or night.
- \* The roof rat is also a house rat and may live in trees, shrubs and in vines on the outside walls of houses.
- \* The Norway rat is the most common rat and occurs practically everywhere.
- \* Because of individual variations, rats often can't be separated by color.
- \* Rats are colorblind and have poor vision, but highly developed senses of smell, taste, hearing and touch.
- \* Rats are omnivorous but do have preferences. They prefer seeds, fresh vegetables or fruits. Norway rats prefer food high in fat content.
- \* Rats will eat just about anything including clothing, leather, bone, lead and plastic pipes, cement, and wood. Rats will eat their own injured or weak.
- \* Rats prefer nesting areas out of sight and reach of enemies and nests can be made up of any kinds of materials but they prefer bits of paper, rags, burlap, straw, and wood chips.
- \* Roof rats are agile climbers and can shimmy the outside of 3-inch diameter pipes or any size pipe within three inches of a wall.
- \* Rats are capable of climbing inside of vertical pipes that are 1 1/2 to 4 inches in diameter.
- \* Norway rats can swim as far as 1/2 mile in open water, dive through water plumbing traps and travel in sewer lines, even against strong water currents.
- \* Roof rats are capable swimmers, but only swim if necessary.
- \* Rats have excellent balance and can easily scale brick or other rough walls, as well as travel along power lines and ropes.
- \* Rats are excellent jumpers and are capable of jumping vertically 36 inches and horizontally 48 inches; they can drop from a height of 50 feet without serious injury.
- \* Since rats can fit through openings that are as small as 1/2 inch in diameter it is very difficult to rat proof buildings.
- \* Norway rats can burrow to a depth of 4 feet.
- \* The roof rat was the common house rat in Europe during medieval times when outbreaks of the Plague, known as the Black Death, killed over 25,000,000 people.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Handout 3

### Natural History

Plague outbreak in India reported in *Newsweek*, 1996

**Perspective and History:** Plague has a remarkable place in history. For centuries, plague represented disaster for those living in Asia, Africa and Europe, where, it has been said, populations were so affected that sometimes there were not enough people left alive to bury the dead (Gross, 1995). Because the cause of plague was unknown, plague outbreaks contributed to massive panic in cities and countries where it appeared. The disease was believed to be delivered upon the people by the displeasure of the gods, by other supernatural powers or, by heavenly disturbance. Innocent groups of people were blamed for spreading plague and were persecuted by the panicked masses. Numerous references in art, literature and monuments attest to the horrors and devastation of past plague epidemics. So imprinted in our minds is the fear of plague that, even now, entering into the 21st century, a suspected plague outbreak can incite mass panic and bring much of the world's economy to a temporary standstill. The number of human plague infections is low when compared to diseases caused by other agents, yet plague invokes an intense, irrational fear, disproportionate to its transmission potential in the post-antibiotic/vaccination era.

**Fundamental Works:** The fundamental but separate works by Yersin and Kitasato in 1894 on the discovery of the etiologic agent of plague in Hong Kong opened the way for investigating the disease and how it is spread. Kitasato and Yersin described, within days of each other's findings, the presence of bipolar staining organisms in the swollen lymph node (bubo), blood, lungs, liver and spleen of dead patients (Bibel et al., 1976). Cultures isolated from patient specimens were inoculated into a variety of laboratory animals, including mice. These animals died within days after injection, and the same bacilli as those found in patient specimens were present in the animal organs. Though both investigators reported their findings, there were a series of confusing and contradictory statements by Kitasato that eventually led to the acceptance of Yersin as the primary discoverer of the organism now named after him, *Yersinia pestis* (Bibel et al., 1976). Yersin had recorded that rats were affected by plague not only during plague epidemics but also often preceding such epidemics in humans. In fact, plague was designated, in local languages, as a disease of the rats: villagers in China, India and Formosa (Taiwan) described that when hundreds and thousands of rats lie dead in and out of houses, plague outbreaks in people soon followed (Gross, 1995). The transmission of plague was described by Simond in 1898. He noted that persons who became ill did not have to be in close contact with each other to acquire the disease. In Yunnan, China, inhabitants would run away from their homes as soon as they saw dead rats. On the island of Formosa, residents considered handling dead rats a risk for developing plague. These observations led Simond to suspect that the flea might be an intermediary factor in the transmission of plague since people acquired plague only if they were in contact with recently dead rats and were not affected if they touched rats that were dead for more than 24 hours. Simond demonstrated that the rat flea (*Xenopsylla cheopis*) transmitted the disease in a now classic experiment in which a healthy rat, separated from direct contact with a recently plague-killed rat, died of plague after the infected fleas jumped from the first rat to the second.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Handout 3

### Natural History

**Ancient Disease:** Plague is an ancient disease that is not likely to disappear; its continued outbreaks throughout the world attest to its tenacious presence. Since the first descriptions, many studies have examined the transmission, epidemiology and pathogenesis of the disease (Gage, 1998). Plague is a bacterial infection of small mammals transmitted from animal to animal by the bite of infected fleas. Plague cycles naturally in its enzootic foci, circulating between small mammals and fleas without human involvement. The quiescent periods, during which few or no human cases are detected, may last for years, leading to mistaken declarations of plague eradication. However long the silent periods last, plague may suddenly reappear. The combination of false assurance of its eradication, and the failure of public health vigilance, sets the stage for the panic that may ensue when enzootic plague spills over from its natural cycle into the peridomestic and commensal rodent populations (and their fleas), bringing plague into closer human contact. Poor sanitation, overcrowding and high numbers of rodents are conditions that enhance urban plague transmission. Thus, a plague outbreak has come to represent an indictment of social, environmental and political changes in the modern world.

#### References:

Bibel DJ, Chen TH. *Diagnosis of plague: an analysis of the Yersin-Kitasato controversy.* Bacteriol Rev 1976;40:633-51.

Gage KL. Plague. In: Colliers L, Balows A, Sussman M, Hausles WJ, eds. *Topley and Wilson's microbiology and microbiological infections, vol 3.* London: Edward Arnold Press, 1998:885-903.

Gross, Ludwik. August 15, 1995. *Proceedings of the National Academy of Science.* Vol. 92, pp. 7609-7611.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 1

### The Trashy Side Of The Middle Ages

By Sir Guillaume "The Salt & Vinegar Knight" de la Belgique

If there is one word which describes the state of life in the Middle Ages, from the regal courts of Europe down to the most humble peasant's hovel, it would have to be: Stinky. Sanitation wasn't an important social issue in the Middle Ages, falling somewhere between equal rights for women and earthworm mating rituals. Although medieval Europe has been described by some experts (notably, by my World History professor) as the armpit of the world (except that he didn't use the term armpit, if you get my drift), the people did their best to maintain the highest level of hygiene possible for a society which routinely allowed livestock to feed in their bedrooms. Let's take this opportunity to examine medieval sanitation with a level of research which is only possible to achieve during the time it takes the delivery guy to arrive with the pizza I just ordered. As in all of my articles, you may rest assured that everything here is either: A) documented through extensive scholarly investigation, or B) I have made it up.

In the Middle Ages, waste disposal was conducted by a technological device that we now refer to as the pig. These pigs, which were kept in both rural and urban environments, enjoyed an extensive diet of waste products, including bones, moldy bread, rotten eggs, broken furniture, rocks, soiled clothing and slow-moving cats. Not only did meandering pigs keep towns free of rubbish, they also provided a secondary benefit for the townspeople whose diet consisted primarily of pigs.

As the urban population grew in the late Middle Ages and Renaissance, city officials began to search for an efficient and innovative means of garbage removal which would allow the crowded masses to live free of filth and contamination and to strive toward the budding sense of mercantile prosperity spreading through Europe. But, after thinking about it, they realized this would be a lot of work, so they just told people to fling their junk into the street. With this system, the roadways soon became absolutely clogged with refuse. One notorious street in London garnered the quaint nickname of Pudding Lane, which sounds like a lovely little holiday parade district until you realize that, because the street went downhill from the butchers' quarter to the Thames, it was knee-deep in rotting entrails (called puddins) which the butchers tossed out to let them ooze down to the river. Knowing that anything they threw out might be lying around for days or even weeks, the people of the Middle Ages became very resourceful in finding uses for things we might consider trash.-- What are we gonna do with this ol' sheep's bladder? -- Oh, put some wine in it and we'll use it to drink out of.

As we search for ways to preserve our resources in the 21st century, we might benefit from reexamining the waste management techniques of the Middle Ages. In fact, when I'm done eating my pizza, I'm going to feed the box to my pig. Maybe it will keep him out of the bedroom for a while.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 2

### Neal Peirce Commentary:

#### Global Cities Population Crisis — Why Should We Care?

By Neal R. Peirce

Washington Post Writer Group

(Neal Peirce is a syndicated columnist who writes about local government issues. His columns do not reflect the opinions of County News or the National Association of Counties.)

For suburbanized, comfortable America, a critical question rises out of Habitat II, the United Nations Conference on Human Settlements that ended June 15 in this historic crossroads city.

The question is this: Why should we care if burgeoning Third World megacities are caldrons of poverty, disease and social desperation? What is it to us if 420 million people in developing countries have no basic sanitation services?

Why should folks living on Philadelphia's affluent Main Line be concerned if 55 percent of Caracas residents are squatters? What is it to suburbanites in Carroll County, Md., or St. Louis County, Mo., or Edina, Minn., if 30 to 70 percent of the people in Bombay, San Paulo or Lagos live in conditions of unspeakable poverty?

After all, the troubled megacities of the world — Mexico City excepted — are thousands of miles from us. And even if we ought to care, the developing countries' urban crisis is a polar opposite of ours.

While such metropolises as Jakarta, Shanghai and Dhaka careen toward jammed up populations of 20 million or more, our cities have been emptying out. For example, Boston's population declined 28 percent from 1950 to 1990. Detroit's 45 percent, Cleveland's 45 percent.

So why not just let the rest of the world confront its urban crises alone?

Belatedly but surely, rebuttal to indifference has been taking shape.

The first powerful rejoinder came with the U.N.'s global environmental summit, in Rio de Janeiro in 1992, as it became clear that North and South, developed and developing countries alike, bear responsibility for such as global warming and acid rain.

Habitat II has thrown the issue into even clearer relief. The exploding cities and shantytowns of the developing world are evidence, said Habitat Conference Secretary General, Wally N Dow, that we are all kinsmen on this shrinking globe, living cheek by jowl as nations and people. The problems of Africa, Asia and Latin America have a tendency to rise up like a tidal wave and hit everyone on this globe.

Unless Americans take a much stronger interest in exploding populations across the globe, said U.S. Housing Secretary Henry Cisneros, we'll later be called on to solve everything from revolutionary outbreaks to health epidemics.

Already, poverty and overpopulation in Latin America are coming home to the United States in unacceptable levels of immigration and worsening poverty in our cities — some of which, like New York, Chicago and Los Angeles, are starting to take on Third World characteristics themselves.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Article 2

### Neal Peirce Commentary:

#### Global Cities Population Crisis — Why Should We Care?

The message of Istanbul is that cities future has become the planet's future — that urbanization of the world's peoples is unstoppable. There can be no real social stability for the planet, no safe ecological future, the delegates said, unless mankind addresses, in cities and neighborhoods of all continents, the intertwined problems of sanitation, shelter, nutrition and education, the rights of women, the interests of children and families.

The job may not be as impossible as it seems. One secret, said attendees from across the globe, is to look to local communities to plan and maintain their own urban projects, from sanitation to day care with national governments assisting, not controlling.

The consensus of Istanbul, Cisneros observes, revolves around decentralization — less direction from centralized bureaucracies, seeing issues such as environment, shelter and sustainability as local. It is the ultimate, says Cisneros, in think globally, act locally.

Localism, ironically, is also the prevailing politics in U.S. communities in a post-federal era.

But there's a deep equity issue, too. With limited funds, the World Bank reported to the Habitat II delegates, city leaders of the huge, poverty-stricken megacities should promote low-cost basic services for the many rather than high-priced services for the few.

Start, said the bank, with a reliable fresh water standpipe within a block of every house, with sanitary toilets and inexpensive drainage ditches. The low-cost and broad coverage would bring improved public health, avert major epidemics and build social stability. With appropriate international lending, even the poorest neighborhoods — and the outlines of global strategies grounded in shared human values start to take shape.

It's inevitable, of course, that oppressive regimes, religious fundamentalism, tribal rivalries will complicate — and some places defeat — recovery scenarios. And whether it's investment in the slums of U.S. inner cities or the chaotic cities of the developing world, entrenched establishments routinely deny basic equity.

But the idea that America is isolated, that it's cost-free for us to ignore the poor whether in our own slums or massed in the globe's new megacities, is as morally flawed as it is strategically obsolete.





## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 3

### Cities and the Environment

#### Introduction

Along with the benefits of urbanization come environmental and social ills, some of staggering proportions. These include a diversity of problems, from lack of access to clean drinking water, to urban air pollution, to greenhouse gas emissions. Although urban environmental problems defy easy categorization, they can be grouped into two broad classes: those associated with poverty and those associated with economic growth or affluence. The two often coexist within the same city.

Some of the worst problems, in terms of human suffering, occur in the poorest cities of the developing world. Especially where population growth is rapid, local governments are unable to provide for even the most basic needs of their citizens. Throughout the developing world, the urban poor live in life-threatening conditions. At least 220 million urban dwellers lack access to clean drinking water; more than 420 million do not have access to the simplest latrines. Between one and two thirds of the solid waste generated is not collected. It piles up on streets and in drains, contributing to flooding and the spread of disease. The problems of urban poverty exact an enormous toll in largely preventable deaths and diseases.

Environmental problems are also severe in those developing world cities experiencing rapid economic growth. Economic growth brings needed revenues to cities, but, if proper safeguards are not in place, it all too often occurs at the expense of environmental quality. More than 1.1 billion people live in urban areas where air pollution levels exceed healthful levels. In cities across the world, domestic and industrial effluents are released to waterways with minimal or no treatment, threatening both human health and aquatic life. These cities still harbor huge populations of the urban poor who are shut off from the benefits of economic growth. Many live in vast squatter settlements, where they are exposed both to the hazards resulting from economic growth, such as industrial emissions, and to the hazards that accompany poverty.

The most immediate and pressing challenge is to improve environmental conditions for the urban poor in the developing world. Given the constraints of rapid population growth and limited financial resources, different strategies will be needed from those previously used in cities in developed regions; these approaches will involve not only technological advances but also efforts to address urban poverty.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Article 3

## Cities and the Environment

### Urban Poverty

Historically, poverty has been concentrated in rural areas. Yet as the bulk of the world's population shifts from rural to urban areas, poverty is becoming an increasingly urban phenomenon. By the year 2000, half of the developing world's absolute poor will be in urban areas. Several factors, including structural adjustment programs, economic crises, and massive rural-to-urban migration, have contributed to an increasing number of urban poor since the 1980s.

In North America and industrial Europe, most of the population, and thus most of the poverty, has been concentrated in urban areas since the beginning of the century. The characteristics of urban poverty, however, are changing. As the manufacturing base of many cities has declined and the middle class has fled to the suburbs, urban poverty has become concentrated in the inner cities and among ethnic minorities, especially in North America.

Children are especially vulnerable to poverty. According to World Bank estimates, in the year 2000, half of the children born in urban areas in developing countries will be in poor families. Child poverty is strongly self-perpetuating. Poor children are more likely to be underweight and malnourished and to suffer ill health and earlier death than their wealthier counterparts. Many poor households rely on child labor for survival, yet this work is often at the expense of schooling and the health of the child, making it difficult for the next generation to escape from poverty. An increasing number of children are also facing new dangers associated with homelessness and street life--an estimated 100 million children struggle for survival daily on city streets.

### Environmental Implications of Urban Poverty

The urbanization of poverty has implications for the urban environment and quality of life. For one, the urban poor bear the greatest burden of urban environmental risks because of the situations in which they are forced to live--whether in the sprawling squatter settlements of developing world cities or in the blighted urban centers of Europe and North America.

Throughout the cities of the developing world, anywhere from 30 to 60 percent of a city's population lives in substandard housing. Unable to afford even the lowest-cost housing, many of the poor build their own makeshift shelters out of cardboard, plywood, or scraps of metal. Overcrowding increases the risks of airborne infections and accidents. Many poor neighborhoods are often unserved by water and sanitation facilities and garbage collection. In some cases, local governments are unable to pay for extending services to these regions; in others, they are reluctant to do so because such action might be seen as conferring legal status on what they consider illegal settlements.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 3

### Cities and the Environment

#### Environmental Implications of Urban Poverty

Whatever the reason, the lack of services increases the risk of intestinal infections and other communicable diseases. In Manila, mortality rates for infants are three times higher in the slums than in the rest of the city, rates of tuberculosis are nine times higher, and three times as many children suffer from malnutrition.

The urban poor are also forced to make trade-offs between affordable housing and environmental safety and protection. Squatter settlements are often located on land no one wants--whether on flood plains or on steep hillsides, where they are vulnerable to flooding and mudslides.

The poor also contribute to local environmental degradation, mainly because the city fails to provide them with the necessary services. If solid waste is not collected, for instance, people must dispose of their own garbage and often do so in inappropriate dumping areas. Denied access to suitable land for housing, families may settle in protected areas of the city, on fragile ecosystems such as wetlands. Disposal of human wastes from the over-water settlements in cities such as Salvador, Brazil, and Manila can be a major source of water contamination. When low-income groups engage in environmentally degrading activities, however, it is usually because they have no alternative.

The poor are understandably reluctant to invest heavily in improving the household or neighborhood environment since they could be evicted at any given time. Similar trends are evident for the poor who reside in many of the thriving cities of developed regions. Although the environmental health threats they face pale in comparison with those experienced by their counterparts in developing regions, their burden is excessive nonetheless when compared with circumstances of the wealthier residents of the same city.

Many of the urban poor lack access to safe and affordable housing. Extended families crowd into one-bedroom apartments, often with rodent infestations, gas leaks, and broken heaters. In the United States, elevated blood lead levels, often from dilapidated apartment buildings with peeling lead-based paint and poor ventilation, threaten the well-being of more than 1.7 million children. The most vulnerable are low-income minority children in central cities. Cold, damp homes impair the health of poor urban dwellers. In Britain, hypothermia results in approximately 30,000 to 60,000 excess winter deaths each year, especially among the poor and elderly who live in poor-quality housing. Some of the major threats to the health and well-being of the urban poor are emerging from the social environment of cities.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

### Article 4

# 7,000,000 Americans... The Most Ignored Poverty

Some people believe that there is no poverty in America. A few years ago the mayor of Jackson, Mississippi, told some visitors that there were no slums in his city. The visitors were shocked at the mayor's ignorance. They offered to take him to certain neighborhoods. He accepted. He was shaken by what he saw. If the mayor of a city could be blind to poverty, imagine how many other Americans might also be blind to it.

God help the man who is only an average human being in Logan County, West Virginia. This is one of the 230 counties of southern Appalachia, the beautiful mountain region from West Virginia to northern Alabama, where 7,000,000 Americans [of Scotch, Welsh, and Irish descent] are gasping from economic suffocation. Today they live in crumbling shacks, sitting idle all day, eating inadequate food.

The total family budget for Mr. and Mrs. Johnson and their eight children is \$165 a month. It is the Federal aid-to-dependent children, administered [run] by the local county and under its rules the highest family payment possible. From this the Johnsons pay \$27 a month rent, for which they get a . . . cottage of four rooms with no running water except for the copious (large) amounts that come through the roof when it rains. They pay \$7.50 a month for electricity which goes mostly for their stove and refrigerator . . . To keep the electricity bill low they cook over an open fire in the back yard whenever possible. This leaves \$130.50 for everything else. For a family of ten, \$130 a month means food.

Those who labor in the earth, wrote Thomas Jefferson, are the chosen people of God.

Jefferson didn't know the American migrant workers, the two or three million men, women, and children who work for pay on other people's farms. Most of them move from farm to farm, about 500,000 from state to state. They live in the most ignored poverty of the American poor. They are almost outside the normal workings of American society except that their hands pick the nation's lettuce, tomatoes, beans, strawberries, onions, potatoes.

At least 10 per cent are children under ten. Mildred Mason not her real name is a skinny girl, a second-generation migrant worker who knows what her life is headed for and wants to change it [She and her husband, Joe] live with their two children in a one-room shack whose roof... leaks. When it rains they all get out of bed and fold the bedsteads into a narrow dry corner. There are no windows, only hinged boards. Fleas and flies are so thick nobody troubles to brush them off. The children, two years and five months old, wake up at 6 a.m. crying from hunger. Joseph pulls on his trousers and starts the family heating system and cookstove- an open fire in front of the shack. Mildred draws water from the near-by pump that serves the twelve shacks in the camp. From the rusted refrigerator outside their shack she takes fatback and powdered milk and coffee after unlocking the padlock. There is no electricity, of course, but the old box keeps rats away from the food....



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 5

### Risk Reduction

Attempts to eliminate fleas and wild rodents from the natural environment in plague-infected areas are impractical. However, controlling rodents and their fleas around places where people live, work, and play is very important in preventing human disease. Therefore, preventive measures are directed to home, work, and recreational settings where the risk of acquiring plague is high. A combined approach using the following methods is recommended:

1. environmental sanitation
2. educating the public on ways to prevent plague exposures
3. preventive antibiotic therapy

**Environmental Sanitation:** Effective environmental sanitation reduces the risk of persons being bitten by infectious fleas of rodents and other animals in places where people live, work, and recreate. It is important to remove food sources used by rodents and make homes, buildings, warehouses, or feed sheds rodent-proof. Applying chemicals that kill fleas and rodents is effective but should usually be done by trained professionals. Rats that inhabit ships and docks should also be controlled by trained professionals who can inspect and, if necessary, fumigate cargoes.

**Public Health Education:** In the western United States, where plague is widespread in wild rodents, people living, working, or playing where the infection is active face the greatest threat. Educating the general public and the medical community about how to avoid exposure to disease-bearing animals and their fleas is very important and should include the following preventive recommendations:

- \* Watch for plague activity in rodent populations where plague is known to occur. Report any observations of sick or dead animals to the local health department or law enforcement officials.
- \* Eliminate sources of food and nesting places for rodents around homes, work places, and recreation areas; remove brush, rock piles, junk, cluttered firewood, and potential food supplies, such as pet and wild animal food. Make your home rodent-proof.
- \* If you anticipate being exposed to rodent fleas, apply insect repellents to clothing and skin, according to label instructions, to prevent flea bites. Wear gloves when handling potentially infected animals.
- \* If you live in areas where rodent plague occurs, treat pet dogs and cats for flea control regularly and not allow these animals to roam freely.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Article 5

### Risk Reduction

- \* Health authorities may use appropriate chemicals to kill fleas at selected sites during animal plague outbreaks.
- \* To avoid potential risk of exposure to hantavirus infection,
  - Safely clean up rodent-infested areas;
  - Air out infested spaces before cleanup;
  - Spray areas of infestation and all excreta, nesting, and other materials with household disinfectant or 10% bleach solution, then clean up, seal in bags, and dispose;
  - Avoid sweeping, vacuuming, or stirring dust until the area is thoroughly wet with disinfectant;
  - Wear rubber gloves; disinfect gloves before removal, and wash hands afterwards.

**Prophylactic (preventive) antibiotics:** Health authorities advise that antibiotics be given for a brief period to people who have been exposed to the bites of potentially infected rodent fleas (for example, during a plague outbreak) or who have handled an animal known to be infected with the plague bacterium. Such experts also recommend that antibiotics be given if a person has had close exposure to a person or an animal (for example, a house cat) with suspected plague pneumonia.

Persons who must be present in an area where a plague outbreak is occurring can protect themselves for 2 to 3 weeks by taking antibiotics. The preferred antibiotics for prophylaxis against plague are the tetracyclines or the sulfonamides.

**Vaccines:** Plague vaccine is no longer available in the United States.

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## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Handout 4

### Fact List: Living Conditions in the Middle Ages

Living conditions in the Middle Ages were uncomfortable by today's standards. Worse than this, these same conditions were often unhealthy.

#### In villages...

- \* Homes had dirt floors.
- \* Families shared common sleeping quarters.
- \* Straw pallets or loose straw were used for mattresses.
- \* Animals often shared living space with humans in the colder months.
- \* Houses were usually a single room with a loft for sleeping and storage.
- \* Walls were flimsy and windows were open to the outside unless shuttered for protection.
- \* Waste was dumped in a trench behind the house.
- \* Roofs were thatched (straw).
- \* Clothes were hung on wooden pegs or stored in a trunk with blankets and utensils.
- \* There was no refrigeration or running water.
- \* Cooking was done over an open fire on a simple hearth.
- \* Rooms were often smoky due to lack of chimneys.
- \* Baths were considered unhealthy.
- \* Wash water was shared by the entire family.
- \* Diet consisted of vegetables from the family's small garden, rye or barley bread, cheese and occasionally a fish caught in a nearby stream, eggs or a chicken.
- \* Gruel, a porridge thinned with water and kept on the hearth for family members to help themselves, served as the main staple in the peasants' diet.
- \* All water used by the household members was fetched from streams or the communal fountain.



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Handout 4

### Fact List: Living Conditions in the Middle Ages

#### In urban areas.....

- \* Streets were narrow and usually muddy.
- \* Homes were multistoried, narrow and close together.
- \* Businesses as well as storage areas were on the first floor, and living quarters were above.
- \* Several families might share the upper stories in poor neighborhoods.
- \* Sunlight was blocked from reaching the street by the buildings.
- \* Garbage and human waste was dumped in the trenches that ran down the center of the streets.
- \* Communal wells and/or rivers were the water source for homes and businesses.
- \* Baths were taken infrequently.
- \* There was no refrigeration or indoor plumbing.
- \* Some animals (primarily pigs, chickens and of course cats and dogs) were kept by the families. These often competed for space on the noisy crowded streets.
- \* Diets were more varied than those of the village dwellers, but only the very wealthy ate meat on a daily basis.
- \* Spices and heavy sauces were often used to disguise the taste of meat not quite fresh.
- \* Urban centers were often ports where ships from around the world docked.
- \* Cities were often built within walls for protection. Gates were locked at night.
- \* These walls led to overcrowding, buildings could not spread out, and so were built upward or wedged between existing structures.
- \* Windows were narrow, but were often protected from the outside by oiled paper or animal skin (later glass).
- \* Sleeping quarters were more private than in villages, complete privacy was rare.
- \* Most floors on the first level were wood or dirt covered with straw; living areas had wooden floors.
- \* Storage of clothing and utensils was problematic as space was at a premium. Cupboards solved the space issue to some extent.

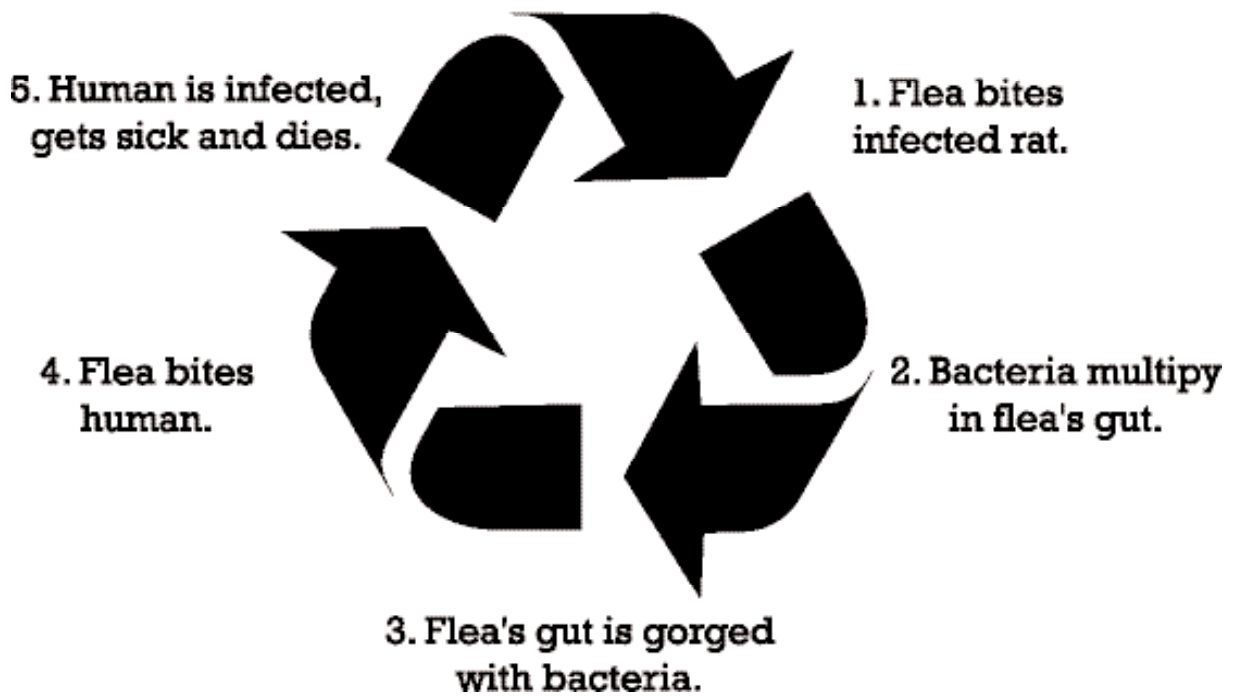




## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Overhead 1

# The Cycle of The Black PLAGUE





## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Overhead 2

**Emerging diseases are dependent upon many factors, including:**

### **Physiological**

- 1) **Transmissibility:** how effective the organism is at moving from one host to another.
- 2) **Life cycle of organism:** the length and progression of the life cycle will directly affect the course of disease, and for any infectious pathogenic organism to survive long-term, it must reach some type of equilibrium between virulence, transmission and propagation.
- 3) **Virulence / mode of transmission:** how contagious the organism is: as is evident, highly contagious organisms will tend to move through a population faster if given the appropriate opportunities, and the capacity for transmission will influence the course of the disease (virulence cannot exceed the length of life cycle necessary for transmission).



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Overhead 3

It is possible to take preventive measures against emerging infectious diseases. But it is only possible to do this by directly addressing the general principles involved in health and disease, some of which include:

- 1) **sanitation:** improve the elimination of waste and take measures to improve the quality of drinking water
- 2) **contact:** decrease risky behavior and decrease unnecessary exposure to potential infectious disease agents
- 3) **poverty reduction:** low incomes tend to bring decreased standards of living, decreased hygiene and decreased sanitation
- 4) **human rights expansion:** the circumstances that promote emerging infectious diseases are often the same circumstances that are generated by a lack of human rights
- 5) **immunological vulnerability:** this can be caused by a variety of factors including increased aging in a population and immunosuppression from other diseases
- 6) **other species:** massive die-offs may hold valuable information regarding potential risks to humans; population dynamics of other animal species should be monitored closely



# Unit 2 Section 3 Lesson 13: Hygiene for Horror

## Group Planning Sheet

Worksheet 1

**Group Members:** \_\_\_\_\_

**Targeted Practice #1:** \_\_\_\_\_

**Contributed to the Spread of Plague Because:** (link explanation to facts about rats and fleas from Handouts 1 and 2)

\_\_\_\_\_  
\_\_\_\_\_

**Action Plan to Correct Condition/Practice** (be specific and realistic in your recommendations, keeping in mind the financial ability and technology available)

\_\_\_\_\_  
\_\_\_\_\_

What should be done? \_\_\_\_\_

\_\_\_\_\_

Why would this help? \_\_\_\_\_

\_\_\_\_\_

**Targeted Practice #2:** \_\_\_\_\_

\_\_\_\_\_

**Contributed to the Spread of Plague Because:** (link explanation to facts about rats and fleas from Handouts 1 and 2)

\_\_\_\_\_  
\_\_\_\_\_

**Action Plan to Correct Condition/Practice** (be specific and realistic in your recommendations, keeping in mind the financial ability and technology available)

\_\_\_\_\_  
\_\_\_\_\_

What should be done? \_\_\_\_\_

\_\_\_\_\_

Why would this help? \_\_\_\_\_

\_\_\_\_\_



## Unit 2 Section 3 Lesson 13: Hygiene for Horror

Worksheet 2

### The Trashy Side of the Teen Ages!

You have learned that certain sanitary conditions contribute to the spread of disease. Are you contributing to the problem? NO WAY? well maybe, but let's take a look at your locker or other personal space (under your bed, a closet, a drawer!)

#### Directions:

List two potential homes for pests that might exist in a locker or other personal space.

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---

List two possible food sources for pests which this area might provide.

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#### Examine Your Locker (or other personal area) Carefully!

What materials for pest homes did you find? Explain.

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What might pests (including lice and fleas) use for a food source in this area? Explain.

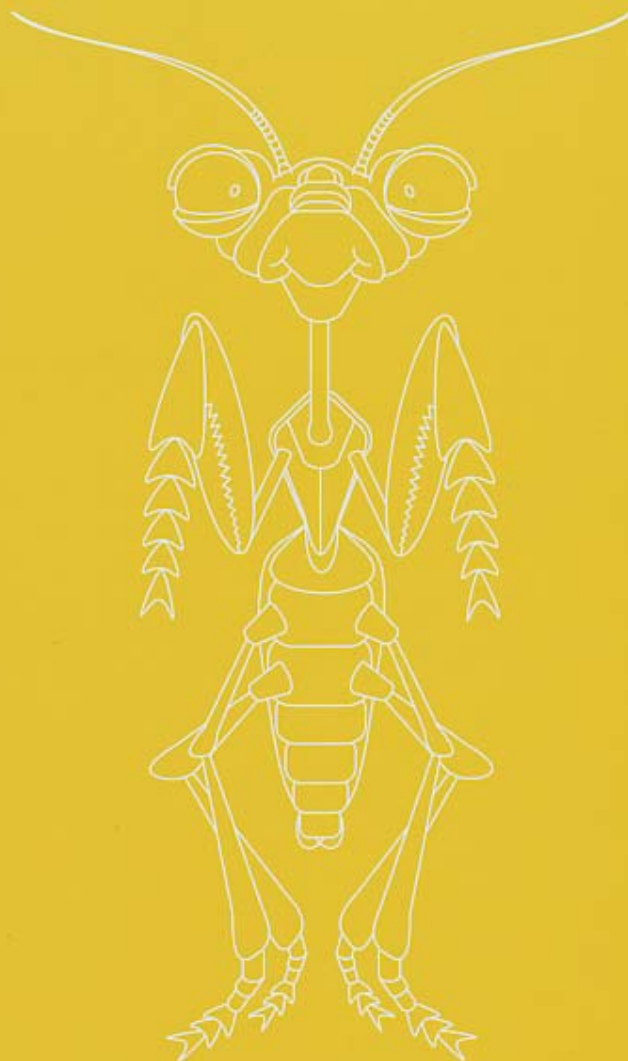
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Develop a Plan to Decrease the Pest Potential in your School or Personal Space!



University of  
Connecticut  
College of Agriculture  
and Natural Resources  
*Cooperative Extension System*



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